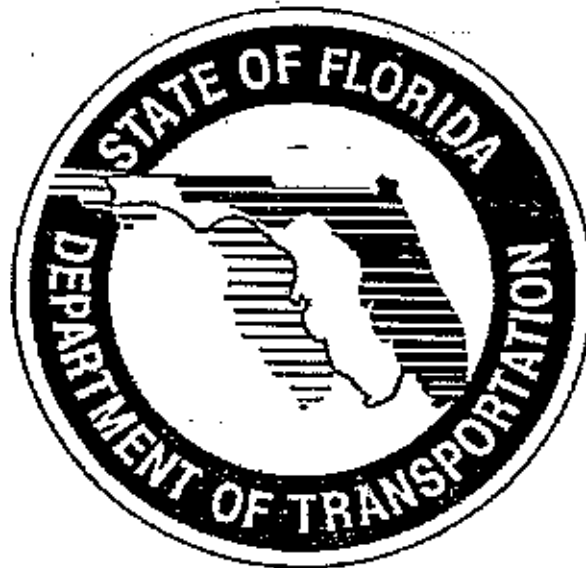


EXHIBIT S

**EVOLUTION OF A
COMMUTER RAIL SYSTEM
IN SOUTH FLORIDA**



Prepared for the
Florida Department of Transportation

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FORWARD

On January 9, 1989 TRI-RAIL began operating between West Palm Beach and Miami. This commuter rail service, initially planned and developed by the Florida Department of Transportation, recently celebrated its second anniversary.

Many agencies and individuals contributed to the development of the service, especially elected officials and staff from Dade, Broward and Palm Beach counties. Special recognition also is made of the Tri-County Commuter Rail Organization and its successor organization the Tri-County Commuter Rail Authority.

Since opening day, rail service has been provided under the direct management of the Authority while financial support continues to be made available through the Florida Department of Transportation.

This report is intended to document the steps in the development of the project and to acknowledge those actions which, in retrospect, represent both successes and shortcomings of the project development process. Recognizing that TRI-RAIL was originally conceived as a means to maintain traffic during the reconstruction and expansion of Interstate 95, it is viewed today as a permanent feature of the transportation system of southeast Florida.

With recent interest in commuter rail as a means to solve transportation problems in other parts of the state, it is hoped that this experience in commuter rail development will be useful to others.

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Evolution of a Commuter Rail System in South Florida

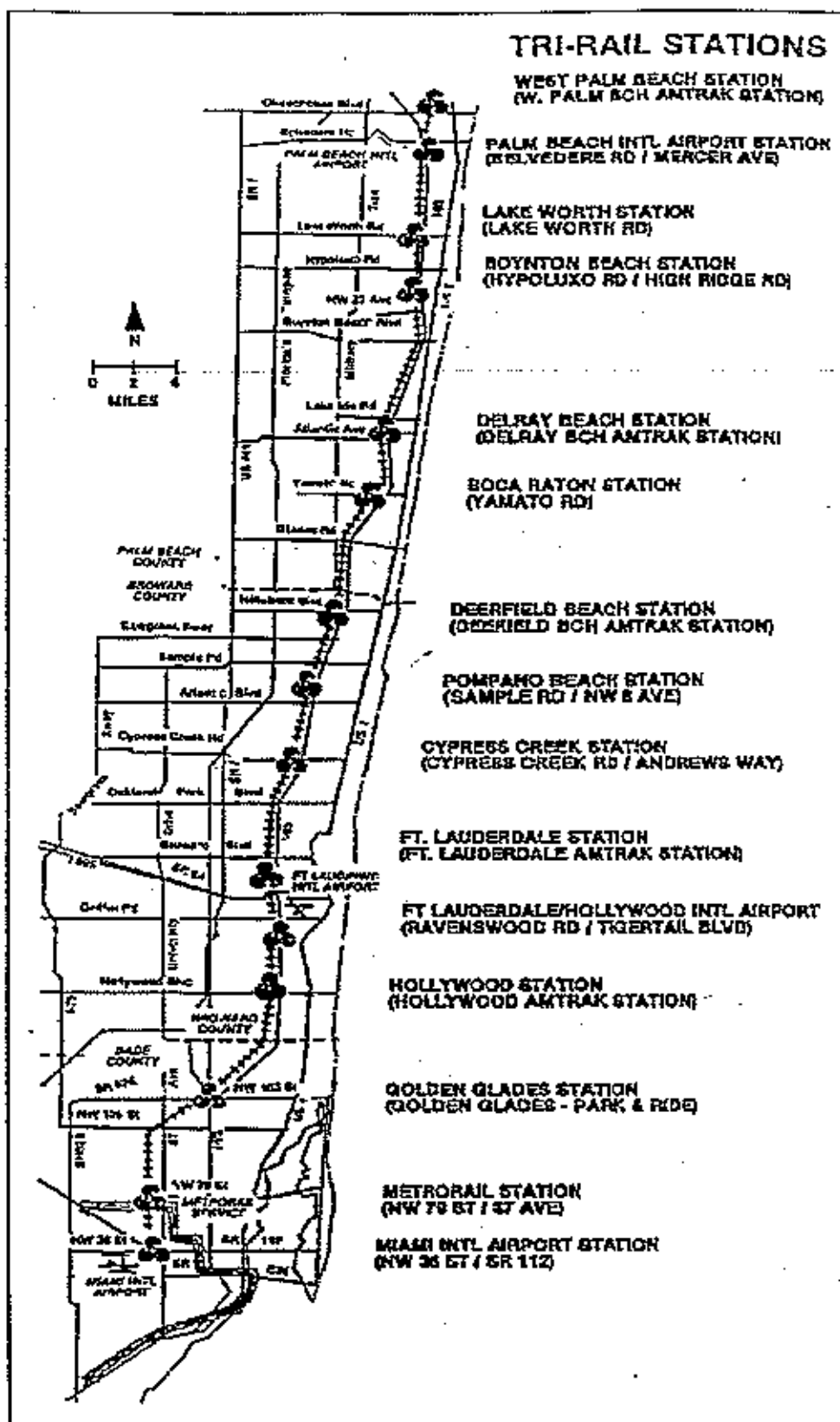
Introduction

The Florida Department of Transportation (FDOT) made the decision in 1983 to investigate the feasibility of a commuter rail system in the West Palm Beach to Miami corridor. This decision was the first step in a six year program which led to the start up on January 9, 1989 of the first commuter rail system implemented in the United States in twenty five years by a state department of transportation and supporting counties. The purpose of this paper is to outline and describe the various steps and processes which brought the rail service on line from its inception in 1983 to March, 1990 after approximately fourteen months of service operations. Hopefully other public agencies in the United States and in Florida, who desire to undertake the provision of commuter rail service on an existing rail line, can benefit from Florida's experience.

Dade, Broward and Palm Beach counties make up Florida's most populated area. The private automobile operating on the Florida Turnpike and Interstate 95 is the major provider of north-south work and recreational trips in the continuous metropolitan area between Miami and West Palm Beach. In 1983 Interstate 95 carried 130,000 vehicles per day, daily vehicle travel demand on I-95 in 1990 was forecast to be 215,000 and 250,000 in the year 2000. These travel forecasts exceeded the planned capacities of I-95 in the future. Other factors which influenced the commuter rail decision was the lack of availability and high cost of land for additional highway construction. The 70 mile long and 12 mile wide corridor between the Atlantic Ocean and the Everglades already contained four major north-south highways (Florida Turnpike, Interstate 95, U.S. 1. and U.S. 1A) as well as two major railroad rights of way (Florida East Coast and CSXT Railroad). The time and cost of condemnation of right of way for new highways or widening the existing highways in this already highly developed corridor, where land was at a premium, was also a factor in the commuter rail decision.

Another major factor in the decision was that other rapidly growing areas in Florida such as Orlando, Tampa, Sarasota-Naples, Jacksonville and the coastal areas in the western Panhandle required a major commitment of available but limited highway construction and maintenance dollars in the future. In summary, the decision was made in 1983 that the time had arrived for investigating the need for a commuter rail demonstration project in the West Palm Beach to Miami corridor. The Florida Department of Transportation therefore initiated a feasibility study.

System Map



I. Background

A. The Feasibility Study

A request for proposals for the feasibility study was advertised nationwide in March of 1983. The study was funded by the Urban Mass Transportation Administration (UMTA) and FDOT in the amount of \$350,000. UMTA funded \$280,000 or 80% and FDOT \$70,000 or 20%. UMTA required that several transportation alternatives be evaluated in the corridor. These included various combinations of buses on the existing north-south highway systems as well as bus-rail combinations utilizing the CSXT and FEC railroads. While the FDOT considered the bus only mode on the highway systems impractical due to peak hour automobile congestion, UMTA nevertheless insisted that bus only alternatives be evaluated. This resulted in increasing the time required to do the study and materially increased the cost of the study.

Four corridors formed the basis for 44 combinations of bus only, rail only, and various rail-bus combinations which were evaluated. The corridors were Interstate 95, the Florida Turnpike, the CSXT railroad and the FEC railroad.

Transportation and Distribution Associates of Philadelphia in conjunction with Gannett Fleming Transportation Engineers and Wolfberg/Alvarez/Taracido Associates were selected to undertake the study from the five firms which responded to the request for proposals.

A Study Advisory Committee consisting of representatives from Dade, Broward and Palm Beach counties as well as the FDOT district and central offices was established to monitor the study effort and work with the consultants.

The basic goal and objective statement established for the study was "To provide a system which provided for the mobility needs of the region by means of a fiscally sound, safe and efficient transit system which would be compatible with land use plans, while improving the environment and promoting energy conservation."

The forty-four (44) bus-rail options on the four rail/highway routes referred to above were reduced to fifteen by use of broad base criteria. These fifteen were given additional analysis. Daily peak period patronage estimates were developed using sketch planning techniques. Rail service daily patronage estimates were between 6,000 and 10,000 while bus service only options were 1,000 to 1,500. The 1,000 to 1,500 bus riders would have little impact on the congestion on the highway system. The next step was to develop operating plans for each of the fifteen alternatives with order of magnitude capital and operating costs. Matrices were then developed which permitted analyzing and comparing operating characteristics, institutional considerations, demographic considerations, and regional impacts. Utilizing these

and the order of magnitude capital and operating costs the fifteen alternatives were reduced to five for further study.

The five final options were as follows:

- | | |
|--------------|--|
| Option One | Rail service on the CSXT railroad from West Palm Beach to Miami with connecting bus service to downtown Miami. |
| Option Two | Option One supplemented with bus service on the Florida Turnpike. |
| Option Three | Rail service on the FEC railroad between West Palm Beach and downtown Miami. |
| Option Four | Option Three supplemented with bus service on the Florida Turnpike. |
| Option Five | Express bus service between West Palm Beach and Miami on Interstate 95. |

The next step in the study process was to further refine the sketch planning patronage estimates using the Florida Department of Transportation's computerized Southeast Florida Regional Planning Model. Rail service options One and Three generated for the year 1986 approximately 8,000 daily peak patrons while the bus options generated less than 2,000. Rail option Three on the FEC, while providing direct access to downtown Miami, was necessarily eliminated because the FEC refused to consider providing a public service commuter rail system on its privately owned single track railroad utilized at the time the study was underway by 24 freight trains daily. The CSXT however on its single track line with four Amtrak passenger trains, four road freight trains and four local switchers, operating during the time the study was being conducted, indicated willingness to negotiate a public service commuter rail contract. Therefore based on the rail ridership projections, route location, minimum capital requirements on the existing railroad, time to implement and negligible environmental impacts, the CSXT corridor was selected as the preferred option.

The 1986 ridership projection of 8,000 daily patrons would not normally justify a commuter rail alternative; however, FDOT had programmed beginning in 1987 extensive construction of additional highway lanes on Interstate 95 between Miami and Boca Raton. In this area I-95 and the CSXT railroad either share a common right of way line or are in close proximity with one another with the railroad being west of the highway. The highway construction was projected to cause a major disruption of highway traffic on I-95 during the programmed four year construction period. The construction was expected to create year 2000 traffic conditions. A

detailed and extensive maintenance of traffic plan was required during the period of highway construction. The Federal Highway Administration (FHWA) in the past had participated in funding commuter rail service as elements of traffic maintenance plans in Pittsburgh, Boston and Philadelphia. The FHWA, with some coaxing as explained later, was agreeable to participating in funding a portion of the Florida commuter rail system's operating costs during the highway construction period. Given the year 2000 highway traffic projections, which exceeded the highway capacity being constructed, the decision was made to project the rail patronage estimates to that date. This was done using the South Florida Regional Model and resulted in a daily rail patronage forecast of approximately 14,000. This ridership and the maintenance of traffic benefits were considered sufficient to justify implementation of the project as soon as possible.¹

Between Boca Raton and West Palm Beach ridership was projected at only 1424 or 10% of the total. Given this low ridership north of Boca Raton and the increased costs of operating an additional thirty miles with five additional stations, the consultant recommended that the rail service initially not be provided north of Boca Raton. Instead the consultant recommended the establishment of an express bus service on Interstate 95 between West Palm Beach and Boca Raton connecting with the commuter rail service. This recommendation was not acceptable to the local and state officials representing the counties. The FDOT therefore included service to West Palm Beach to retain a consensus, which proved to be useful during following phases of project development when funding was being pursued. The project subsequently received support from the majority of the elected city, county and state officials as well as Florida's federal congressional delegation.

FDOT, in making the decision to progress the project, was implementing in the most critical transportation area of the State a rail service which was ten years ahead of its projected need. It was a given throughout the organization, planning, design, funding, and construction of the project, that if the rail service did not attract sufficient ridership to warrant long term continuation by the end of the highway construction period, it would be suspended until such time as rail travel demand justified reopening it. Therefore capital and operating costs in the following areas

¹ While the highway construction was expected to artificially create year 2000 traffic conditions, this did not materialize in the first year of commuter rail service because:

1. It was an unrealistic expectation that ridership would build to 14,000 in such a short period of time; and,
2. The maintenance of traffic plan, developed and implemented for the Interstate 95 construction, worked so well that the traffic congestion experienced did not motivate highway users to switch to the rail mode.

were minimized to the maximum extent possible without drastically compromising the level and quality of service to the point where an unacceptable revenue/cost ratio resulted.

1. Rehabilitation of the existing railroad facilities.
2. Acquiring or leasing used locomotives and coaches.
3. Constructing the minimum required unattended stations.
4. Administration, maintenance and train operations.

These objectives, while established in good faith to affect a minimum cost commuter rail system, were not realized primarily because of railroad and county imposed requirements which were not anticipated in the original system plan and cost estimates.

B. Project Organization

The feasibility study was completed in December of 1984. The year 1985 was used primarily in organizing for the management of the project and in obtaining support from Dade, Broward, and Palm Beach counties and their respective elected officials at the county, state and federal levels.

In 1985 the FDOT was in the process, based on a state legislative mandate, of decentralizing many of its central office functions from Tallahassee to the existing six transportation district offices throughout the state. The responsibility for carrying out the project was therefore transferred to the Fourth District Office in Fort Lauderdale, which is centrally located on the railroad. Each district had a division of public transportation operations whose prime responsibilities were assisting the cities and counties in securing funding and implementing public transportation systems. Their area of activity was primarily in the transit (bus) and aviation fields where an annual dedicated source of federal funding was available from the Federal Highway Administration, the Urban Mass Transportation Administration and the Federal Aviation Administration.

In late 1985, the central office Rail Bureau developed a request for proposals and scope of services for consultant assistance to develop, design and manage the engineering and operational work necessary to carry out the project. The consultant team was hired in April, 1986 and project management was transferred to District Four.

The success of the district in managing the project was based on the following three events:

1. Knowledge and experience in the administration and local coordination needed throughout the project;
2. Availability and use of central office rail expertise for technical assistance; and
3. Availability of a consultant team to respond to planned and unforeseen technical, operational and legal needs throughout project implementation.

Project management by the District was necessary in order to effectively implement the project with the local agencies' involvement. While having experienced commuter rail personnel on district staff would have been helpful, it was not necessary. Technical expertise already was available through the central office. Furthermore, the need for short-term and varied expertise lent itself to use of consultants. The importance of this decision cannot be overemphasized. Hiring a consultant team

experienced in commuter rail operations was one of the most important factors in the FDOT's ability to meet the short schedule for implementation.

Management of the project reverted to the central office in January, 1988. The major contention by central office officials was that the implementation of the project was slowed due to the lack of experienced railroad personnel in the district. A more significant factor, contributing to the delays encountered, however, was that the department underestimated the amount of local coordination, especially with the TCRO, necessary throughout the project.

Today, project coordination lies primarily in the district. There is a recognition that each office has its own expertise and ability to contribute and assist in the project. The successful relationship which has evolved is the result of the high degree of communication between the offices as well as the collaboration and coordination of all decisions.

1. Technical Plan Scope of Services

Key aspects of Phase A of the technical plan scope of services were:

Phase A

1. Assistance in progressing funding and grant applications.
2. The development of a fixed facility layout plan and a train operation plan.
3. The development and execution of use of facilities and purchase of service agreements with the railroad including the necessary indemnification and liability insurance.
4. The investigation of the acquisition of new or used locomotives and coaches, the economics thereof with a recommended course of action, the preparation of specifications and the necessary contract negotiations with supervision of construction and delivery of the equipment.
5. Development of a staffing plan for operation of the service and its administration.
6. The development of an accounting and statistical reporting system for administration and train operations.

The key elements in the technical plan are listed above in the priority order which was required to meet the earliest possible start of service date, coinciding with the highway maintenance of traffic plan, with element 1 being updated as refined cost estimates became available.

The responses to the technical proposals were received in late February, 1986 and a contract was executed in June, 1986 to a consortium of firms headed by DeLeuw Cather and Co. of Washington D.C. The other subcontractors and their responsible areas of work were:

1. Guilford Transportation Industries. A consulting subsidiary of the Boston and Maine Railroad in Boston. Their project work areas of responsibility were the operating plan, the equipment acquisition, station operations and method of fare collection, and the accounting and reporting systems.
2. L. E. Peabody and Associates Inc. A firm experienced in negotiating railroad operating and use of facilities agreements.

3. Delon Hampton and Associates Inc. A firm specializing in the design of locomotive and passenger car maintenance facilities as well as stations, parking lots and access roads.
4. John Beck, Esq. A Tallahassee legal firm engaged initially to handle the legal work associated with developing and negotiating the operating and use of facilities agreement with the CSXT. The magnitude of the total amount of legal work which eventually transpired involving the railroad, the cities and counties, equipment procurement, Federal Railroad Administration funding, insurance requirements, service operators, and private developers interested in providing stations, was not foreseen. Consequently the legal assistance costs were grossly underestimated in the DeLeuw Cather contract. Existing FDOT legal staff were not assigned full time to the project because of the Department's already heavy work load. FDOT attorneys, however, reviewed the agreements executed by the Department. Also, this firm eventually was used when the FDOT pursued outright acquisition of the rail corridor (see section on rail corridor acquisition). Use of the firm for this purpose contributed to the underestimation of legal assistance costs.

The DeLeuw Cather contract for the accomplishment of the tasks in Phase A as outlined above was initially for \$780,591 with the tasks to be completed in eighteen months. The amount expended as of January 10, 1990 was \$3,421,807. The increase was accommodated through supplemental agreements to the original contract. The increase was necessary because the initial contract did not include all legal costs, station final design costs and construction engineering inspection costs. Included in the supplements was a subcontract with James A. Stoetzel and Associates of Andover, Massachusetts in the amount of \$699,228 to provide railroad engineering and operating assistance to the FDOT and the Tri County Commuter Rail Organization (TCRO).

Phase B

This phase of the contract was optional and required the contractor to supply experienced railroad staff personnel in the necessary disciplines to start up, manage, and supervise operations and maintenance of the commuter service until such time as a responsible public transportation agency was established and in a position to assume management and operations of the service. This phase of the contract was never activated because such an agency was formed in the interim.

2. The Tri County Commuter Rail Organization

The Metropolitan Planning Organizations (MPO) of the respective three counties were represented on the feasibility study technical review committee and participated in the decision making process leading to the implementation recommendation. This, with the assistance of various chamber of commerce's and other public bodies, resulted in a recommendation to the respective county commissions and area state legislators that a commuter rail authority be legally constituted to assume management and administration of the construction and operation of the system. Since Florida Statutes authorized counties to join together to form public transportation authorities, a six member "Tri County Commuter Rail Organization" (TCRO) was formed by interlocal agreement under Chapter 163.567, F.S. Each MPO appointed two of its members to serve on the TCRO governing board for a two year period. Chairmanship of the organization rotated annually by vote of the members.

An interlocal agreement spelling out the working arrangements between the counties and FDOT was executed in January of 1986 and the TCRO held its first meeting in February of 1986. The FDOT district office in Fort Lauderdale established a commuter rail project engineer whose function was to manage the DeLeuw Cather engineering group and coordinate all aspects of the project in which the FDOT was involved with the TCRO and other involved or affected public agencies. The TCRO had review and approval authority over all project actions and conducted monthly meetings open to the public and press to carry out its business. The DeLeuw Cather engineering consultant group and the FDOT project manager gave a monthly status report at each TCRO meeting outlining the status of each task in the development of the project and presented new action items for discussion and approval by the TCRO. As the project developed the district work effort increased to the point where two professional positions were required to manage the consultants and interface with the TCRO and the involved cities and counties.

It should be noted that the initial project schedule underestimated the amount of time needed for local reviews and approvals, especially for legal items. The legal process involved a review by separate attorneys from each of the three county legal offices that jointly constituted the TCRO legal staff. The county attorneys had other duties; they also had limited knowledge of railroad technology and operations. Consequently delays were common while documents were subject to deletions, additions, and compromises to satisfy each of the three counties involved. It also should be noted that this commuter rail endeavor was the first project the three counties had undertaken together under an interlocal agreement in their history.

The initial concept in 1983-1985 in accordance with Phase A and B of the technical plan in the DeLeuw Cather contract outlined above was that the FDOT would carry out all the considerable actions necessary to bring the service on line and then once the service was up and running turn it over to a duly constituted three county

transportation authority. This did not happen because the three counties recognized that important decisions were being made regarding the design and operation of the system. This initially created an awkward situation because funding for staffing the TCRO was not appropriated by the legislature until June of 1986 and the TCRO/FDOT interlocal agreement defining the terms of the financing was not executed until July, 1986. The TCRO subsequently did not begin staffing their organization until December, 1986, approximately one year after their formation. In the interim the project was managed by six county commissioners at monthly TCRO meetings.

The TCRO initially employed an executive director, an executive secretary, a secretary, a manager of finance and administration, and a marketing manager. The only person on the staff with any railroad experience, however, was the executive director who was a former general manager of the Toronto Transit System in the 1960's. With the start up of the system targeted a scant two years in the future the TCRO had not employed any experienced railroad operating or maintenance personnel to oversee the start up and operation of the commuter system.

Experienced railroad people in the field to manage and oversee the day to day operations of the system and to administer the operating and maintenance contracts were not employed until two months before the start up date of January 9, 1989. The operating contractor began conducting equipment test runs and schedule verifications on October 1, 1988. TCRO's equipment superintendent and safety manager were employed in November, 1988 with the transportation superintendent coming on board in December, 1988.

The 1989 legislature subsequently enacted Chapter 343, Florida Statutes, which created the Tri-County Rail Authority (TCRA). TCRA is governed by a nine member board which consists of two members from each of the three counties appointed by the county commissioners, the Secretary of the Department of Transportation, the Florida High Speed Rail Transportation Commission, and the Governor each appoint one member. The TCRA was given expanded powers and duties which are summarized as follows:

- The right to own, operate, maintain, and manage a commuter rail system in the three county area.
- Authority to plan, develop, own, purchase, lease, or otherwise acquire, demolish, construct, improve, relocate, equip, repair, maintain, operate and manage a commuter rail system; also determine policies and adopt rules necessary to govern the operation of the system.
- Inherit all rights, assets, agreements, appropriations, privileges, and obligations of the TCRO.

- The power of eminent domain.
- Acquire, purchase, hold, lease, and use any property, real, personal, mixed, tangible or intangible, necessary or desirable for carrying out the purposes of the authority; Also sell or dispose of any real or personal property acquired by the authority, including air rights.
- Fix, alter, establish, and collect rates, fares, fees, rentals or other charges for the use of any commuter rail system facilities owned or operated by the authority.
- Develop and provide feeder transit services to the rail stations.
- Adopt by-laws for the regulation and conduct of its business.
- Lease, rent, or contract for the operation or management of any part of a commuter rail system or commuter rail facility, including feeder transit services.
- Enforce collection of fares and establish and enforce fines and penalties for violation of rules.
- Advertise and promote the commuter rail system.
- The power to employ staff, to contract with other government agencies, to enter into joint participation agreements and to accept funds from government and private sources.
- Issue revenue bonds which are not debts of the state or backed by the credit of the state.
- The TCRA was required by February 1, 1990 to develop and adopt a plan for the operation, maintenance, and expansion of the commuter rail service. The plan is to address the development of public and private revenue sources, the service to be provided, and the expansion of the current service. The plan is to be reviewed and updated annually.

II. Funding Considerations

A. State and County Shares

The TCRO, various citizens groups, and state legislators from the three counties met with the Governor and representatives of the Senate and House Transportation Committees and drafted a commuter rail funding bill for presentation to the Florida Legislature. The bill was passed by the Legislature as Special Appropriation # 1758 in the amount of \$59,950,000 in the 1986-1987 General Appropriations Act.

A brief summary of the distribution of the appropriations follows:

Distribution	Funds
Capital Improvements	\$31,300,000
One Year Systems Operations	\$12,150,000
Collateral for a FRA loan for rehabilitation of railroad fixed facilities	\$16,500,000
TOTAL	\$59,950,000

A budget amendment for \$24,000,000 for additional capital and operating costs was subsequently approved, making the total 1986-1987 appropriations \$83,950,000. The appropriations were governed by the following conditions:

1. The state would fund the non-federal share of the capital and operating costs for the first five years of the operations between Yamato Road (MP 992.3) in Palm Beach County and the Hialeah AMTRAK station (MP1033.5) in Dade County, a distance of 41.2 miles, and commonly referred to at the time as the core system.
2. The state would fund the non-federal share of the capital costs between the West Palm Beach Station (MP 970) and the station at Yamato Road (MP 992.3) and between the AMTRAK Hialeah Station (MP 1033.5) and the Miami Airport Station (MP 1036.5), a combined distance of 25.3 miles, and commonly referred to at the time as the extensions.
3. In the first three years of operations the counties and the state each would fund one half of the operating deficit for the extensions. The counties would pay their share of each year's deficit in the last three

quarters of the following year. If the extensions were to operate after the third year the counties were to be solely responsible for funding all related operating costs. The commuter rail extensions were considered rail service demonstration projects. This required that after the second year of operations the extensions had to reach a revenue to cost ratio of 60% or more or be discontinued.

4. During the first five years of operations not less than one million dollars would be set aside from the farebox revenues to retire the \$16.5 million federal (FRA) loan (see Section C Federal Railroad Administration, Section 505 Loan). This loan required payment over a twenty year period beginning with the sixth year of operations.
5. At the end of the third year of operations the counties were to decide whether or not to assume responsibility for the entire rail project at the end of the fifth year of operations. This included repayment of the FRA loan of \$16.5 million.
6. The three counties with the TCRO or other legally constituted authority were to develop and implement a feeder bus system to fully support the commuter rail system and ensure maximum ridership.

The 1989 Florida legislature amended the funding conditions outlined above by passing the following:

"F.S. 341.320 (d) Any service development project funded under this section shall continue to be eligible for such funds in the third year of operation only if the project reaches an operating ratio of 60 percent or more during the second year, or, for a tri-county commuter rail, an operating ratio of 40 percent or more during the second year. All intercity and commuter rail service development projects shall be limited to 3 years except for a tri-county commuter rail, which shall be limited to 5 years."

The 1986-1987 Appropriations Act also required the three counties and the FDOT to develop and execute an interlocal funding agreement before release of any of the Act's funds. This agreement was executed by the two parties on July 9, 1986. This interlocal agreement in general followed the requirements set forth in the Appropriations Act with the exception that it qualified the maximum amount of monies the counties would have to pay as their 50% share of the operating deficit on the extensions. The total county share was set at a maximum of \$1.15 million or \$383,333 per county.

Subsequent yearly state appropriations acts authorized the following funding for the project:

State Appropriation	Funding
FY 1987-1988	\$18,280,000
FY 1988-1989	\$16,130,000
FY 1989-1990	\$13,800,000
TOTAL	\$48,210,000

Thus making the total appropriated by the state \$132,160,000.

B. State of Florida Exxon Oil Overcharge Entitlement

In 1985 a federal court ruled that the Exxon Oil Co. had overcharged Florida citizens \$91 million for products it sold in the state and that the state was entitled to a refund in this amount. The Governor's Energy Office was the designated agency assigned the responsibility for distributing the funds. The money was to be used statewide on public projects which enhanced energy conservation and improved the environment. The commuter rail project met the funding criteria primarily because it reduced automobile fuel consumption and the associated emission of noxious gases.

Two grants were made for the commuter rail project. A grant in the amount of \$4,000,000 for design and engineering and a grant for \$400,000 for a market research study. The FDOT utilized the engineering funds in the DeLeuw Cather and Company technical work plan and the Dade Metro Station design. The TCRO contracted for the market research study.

Only \$2.3 million of the \$4.4 million in Exxon funds committed to the project have been reimbursed to date because overhead, profit and other indirect labor costs were determined not to be eligible for reimbursement under the Exxon overcharge entitlement criteria.

C. Federal Railroad Administration Section 505 Loan

Another important funding source to the project was provided by the Federal Railroad Administration (FRA) under Section 505 of the Railroad Revitalization and Regulatory Reform Act of 1976. This section provided funds to the FRA to loan to railroads nationwide to rehabilitate marginally profitable branch lines with deferred maintenance that were essential to a region's transportation economy. The Section 505 funds were not normally eligible for commuter rail projects, however, through persuasion by the Florida Congressional Delegation the FRA reluctantly agreed that the railroad between West Palm Beach and Miami met the FRA Section 505 deferred maintenance criteria eligibility because it was inadequate to meet the projected freight and passenger train needs of the area for the next twenty years. The FRA Section 505 loan was necessary if the region was to receive the public benefits provided by the commuter rail service while continuing to receive existing and projected benefits from the freight and AMTRAK passenger service.

The initial amount of the loan, \$16,500,000, was reduced to \$15,960,000 by Gramm-Rudmann (national) deficit reduction provisions. From this amount \$4,000,000 was used by Dade County in the construction of the N.W. 79th Street Dade Metro/Commuter Rail Station and the remainder was committed to finance the rehabilitation of the CSXT rail facilities. Under Section 505, loans were available only to railroads, therefore the TCRO as a legally constituted commuter railroad authority was designated as the recipient of the loan. The FDOT was not eligible. The drafting of the FRA Section 505 loan application and its negotiation, primarily between the FDOT and the FRA, required one year and three months. The loan agreement was executed on July 31, 1987.

The loan application consisted of some 1700 pages of text and exhibits. An economic analysis of the cost of installing and rehabilitating the railroad to provide the commuter service was required. The application also included a description of the existing railroad, its current operational characteristics and the effect the commuter rail addition would have on the current operations. Also required was an environmental impact statement, an energy savings analysis, a listing of the benefits to the public, and the justification for implementing the project. The environmental impact statement was provided by an environmental consultant under district office supervision. FRA was particularly interested in the annual operating costs of the commuter rail service and the annual revenues from which the loan was to be repaid. The loan agreement between the FRA and TCRO required TCRO to place \$1,000,000 annually from the farebox revenues in a interest drawing account from which the loan would be repaid.

As a condition of the loan the FRA required the State of Florida to guarantee from the State Transportation Trust Fund the repayment of these TCRO obligations with accrued interest. This was approved by the Florida Legislature.

With assistance from the Florida Congressional Delegation, in October, 1989 an agreement was reached between the FRA and TCRO/FDOT to terminate the loan agreement upon payment to FRA of \$350,000. Loan funds drawn down had totaled \$6,870,000 through October, 1989. This amount of money thus became a 100% grant from the FRA to the TCRO/FDOT. The remainder of costs associated with work eligible to be funded from the FRA loan were financed 100% by the state. The termination of the loan also released TCRO's annual obligation to place \$1,000,000 in farebox revenue in trust with which to pay off the loan.

D. Federal Highway Administration

The Federal Highway Administration (FHWA) initially rejected Florida Department of Transportation's proposal that the commuter rail system be included as a major element of the maintenance of traffic plan for the Interstate 95 expansion project. However, with assistance from the Florida Congressional Delegation, the FHWA subsequently agreed to fund up to \$4.0 million per year of the annual operating costs of the commuter rail system during the highway construction period.

E. Funding Summary

As of February 1, 1990 a summary of the project's actual funding authority, reflecting changes in the FHWA, FRA and Exxon Oil Overcharge funding, is noted below:

Project Funding Authority	Funding
State Funds	\$97,894,624
FRA Federal Funds	\$6,870,000
FHWA Federal Funds	\$8,000,000
Exxon Oil Overcharge Funds	\$2,300,000
Local County Funds and Anticipated Revenues	\$5,305,376
Total Appropriations	\$120,370,000

F. Operating Revenues

The feasibility study and FDOT recommended a graduated zone fare structure based on the miles traveled. The TCRO, however, chose to adopt a fixed fare of \$2.00 per trip over the entire 67 miles to simplify ticket supply, ticket sales, and ticket verification onboard trains. The feasibility study also estimated that the area north of Boca Raton would generate only 9% of the patronage. The first seven months of operations indicates this area has generated 22% of the revenues from the fixed \$2.00 fare. A conclusion from this is that the fixed fare has attracted considerably more riders than was estimated from Palm Beach and north Broward counties. This may be due to the low fixed cost for a ride which could be up to 67 miles in length, in combination with commuter rail system amenities such as comfort and lack of delays and accident potential had these patrons continued driving on I-95. Conversely, the \$2.00 fixed fare may be too high for the lesser mileage trips between Hollywood, Golden Glades and Miami. This area is more heavily populated and more subject to excessive automobile trip times due to highway congestion. Thus, imposition of a fixed fare may not be optimizing ridership in Broward or the northern part of Dade County where the feasibility study indicated the most need for relief of the highway system.

The service operated from January 9, 1989 until June 1, 1989 without charge. Beginning June 1, 1989 fares were charged. The basic fare charge was \$2.00 regardless of trip length. The types of tickets available include daily, round trip, discount, weekly, and monthly. The weekly and monthly tickets can be purchased by mail or telephone using checks or credit cards.

Revenue generated by train operations between June 1, 1989 and December 31, 1989 amounted to \$724,504. Ridership during this period stabilized at about 3,000 trips per day. A mid-day train was added in January, 1990 increasing the number of daily trains from 18 to 20. Also effective April 1, 1990 all trains began making round trips between West Palm Beach and Miami stopping at each of the 15 stations daily. The additional train and station stops increased ridership by approximately 2500 additional trips to 5500 daily. A major increase in marketing also should be credited for this ridership improvement. Revenue for the first three months of 1990 was \$486,695. A revenue summary from June 1, 1989 through March 31, 1990 is included in Section VI. A. 3.

III. Railroad Company Coordination

A. Existing Railroad Facilities

The railroad over which the commuter service was proposed to operate was part of the original Seaboard Air Line Railroad System constructed in Florida in 1927. The Atlantic Coast Line and the Seaboard Airline Railroads merged in 1967 becoming the Seaboard System Railroad, which later merged with the Chessie System becoming the CSXT in 1986. FDOT began negotiations for the commuter rail project with the Seaboard System Railroad in 1983.

The railroad is a single track railroad with a maximum passenger train operating speed of 79 mph. It is a centralized traffic controlled railroad dispatched from Jacksonville, Florida by CSXT train dispatchers. In the 67 mile route between West Palm Beach and Miami there are 11 remote controlled sidings where trains may pass. The sidings average 5.45 miles apart with the longest separation being 8.4 miles and the shortest 3.3 miles. The capacity study performed by Transportation and Distribution Associates indicated that four commuter trains in each direction, in the morning and afternoon peak travel periods, could be operated without double tracking the line if the through freight and local switchers were operated outside the commuter train time envelopes. The railroad concurred in this finding with the provisos that the morning commuter envelope be between 5 a.m. and 9:30 a.m. and the afternoon envelope be between 2:30 p.m. and 7:30 p.m. Further, CSXT insisted that Amtrak trains operating within these envelopes would have superiority over the commuter trains. Unfortunately all 4 Amtrak long distance intercity trains to and from the northeastern cities of the United States arrived in or departed the Miami area within the designated commuter hours. Despite the fact that commuter trains consequently would experience delays from passing Amtrak trains daily, the CSXT and Amtrak were adamant in their refusal to accept any delay to Amtrak trains or to modifying Amtrak schedules to improve commuter train performance. The basic reason for the CSXT position was that CSXT received compensation incentive payments from Amtrak for each train it operated if the train arrived at its destination within five minutes of its scheduled time. Amtrak initially refused to adjust its schedules because early morning and evening arrivals and departures were the most desirable for intercity rail passengers.

B. Rehabilitated Railroad Facilities

The feasibility study indicated that the existing physical condition of the railroad was such that major routine maintenance and upgrading expenditures would not be required. The railroad had been maintaining the route for years to FRA Class 4 track standards with a maximum speed for Amtrak trains of 79 mph. However when the FDOT began negotiations with the CSXT for use of the facilities the railroad was adamant that major rehabilitation work would have to be done at public expense before they would agree to joint use of the facilities with the commuter rail system. Their reason for this position was that the level of service on the line would go from eleven trains per day to twenty-nine. Given the commuter train operating envelopes, track maintenance time would be substantially reduced during their established working hours between 7:30 a.m. and 4 p.m.. CSXT therefore could not economically do the required work with their highly mechanized system maintenance gangs.

The railroad insisted that the following major items of work be accomplished before the start up of commuter rail service:

1. The main track and passing sidings be relaid with continuous welded rail (CWR) replacing bolted rail. This required the laying of approximately 50 miles of rail on the main tracks, 25 of which were new, and eleven miles of fit rail on the passing sidings.
2. The ongoing annual retieing cycle be completed. This required retieing twenty-two miles of the main tracks and six miles of the passing sidings. A total of 25,000 ties were replaced.
3. The main track and passing sidings be resurfaced. Approximately 90 miles of resurfacing were done, the majority of which was behind the rail and retieing work.
4. Various items of signal work were required, i.e., 8 sidings were signaled to permit 40 mph speed, lightning protection was modernized, an interlocking was installed at the south end of Hialeah yard, the New River drawbridge was converted from a mechanical locked bridge to an electrical interlocking, grade crossing protection devices at station locations were modified, a main track signal system was installed south of Hialeah, the traffic control machine in Jacksonville was modified, and a new crossover was installed in the middle of Pompano siding.
5. Two timber trestle bridges were replaced with precast concrete bridges and one bridge widened from a two to a three track structure.
6. Twenty seven out of 54 major highway grade crossings were completely

rebuilt.

7. Major rehabilitation of track work in the engine house and passenger coach yard at Hialeah were required.
8. The railroad also required the extension of the Boynton Beach siding and the construction of a 1.5 mile long siding at Hialeah Yard to facilitate make up of CSXT trailer on flat car trains.

Items 4 and 8 were required to improve the railroad's capacity to accommodate Amtrak, CSXT freight and the commuter trains.

The Transportation and Distribution Associates feasibility study estimate of the cost for capital improvements, excluding the Dade Metro station, to provide the capacity to accommodate the commuter service was \$15.4 million. The railroad's initial estimate including deferred maintenance was \$19 million. It appears the final cost, with certain minor work items still to be closed out, will be approximately \$16 million.

The CSXT would not enter into a fixed fee contract for the work which was to be done and required a reimbursement contract based on the actual costs incurred to do the work. All work had to be done by railroad union employees in their respective union crafts at union scale subject to annual cost of living increases, per diem and housing costs for its division and system gangs, and subject to their craft union work agreements. CSXT's union agreements and its inability to permit FDOT to competitively contract certain items of the work locally materially increased the construction and rehabilitation costs of the fixed railroad facilities.

C. Railroad Access and Service Agreement

Although the state's purchase of the CSXT rail corridor from West Palm Beach to Miami (see the next section) negated the need for an access and service agreement, the experience gained in negotiating the agreement may be helpful to the reader. This agreement provided for and defined the terms and conditions for use of the railroad property and facilities by the commuter rail system. It was executed on June 9, 1987 by the Florida Department of Transportation and the CSX Transportation, Inc.

The agreement was based on the assumption of Amtrak operating the commuter rail trains and maintaining the equipment at the Hialeah car shop owned by the railroad but operated by Amtrak with CSXT union employees. The TCRO was named as a third party beneficiary in the agreement entitled to the same rights in the agreement as FDOT.

CSXT agreed to provide access to the property and use of the facilities but required that CSXT union employees, working under the railroad's current union agreements, would have to construct and maintain any railroad facilities used by the commuter rail system. This requirement subjected the commuter service to established union wage scales and inefficient seniority and work rules negotiated by collective bargaining between the railroad and its employees. This precluded the FDOT/TCRO from competitively bidding from private railroad contractors, potentially at considerably less cost, the work necessary to maintain the commuter rail facilities. The railroad had no choice in the matter, given its ownership of the property and its common carrier freight operations jurisdiction over the same main tracks. CSXT agreed to lease to FDOT/TCRO land areas on which eleven commuter rail stations with parking lots and access roads were to be constructed. This permitted the FDOT/TCRO to competitively bid for the station's construction.

CSXT agreed to dispatch the commuter rail service in a safe and efficient manner complying with all federal, state, and local statutes. They also agreed to maintain the main tracks to FRA Class 4 track standards which permit a maximum operating speed of 79 mph for passenger trains.

The agreement required FDOT/TCRO to acknowledge that certain of the facilities necessary for commuter operations also were subject to Amtrak operational rights accrued by Amtrak under the National Railroad Passenger Service Act of 1970. FDOT/TCRO were required by CSXT to respect Amtrak's rights or negotiate a contract with Amtrak for assignment of these rights to FDOT/TCRO. As referred to above, the agreement assumed that Amtrak would be operating the service for FDOT/TCRO. In fact, FDOT/TCRO were engaged in negotiations with Amtrak at the same time it was negotiating the facility use with CSXT. The Amtrak negotiations failed and complicated the joint use of facilities by the two parties. The Amtrak

negotiations are further addressed in Section V-A of this report.

- The agreement with CSXT permitted FDOT/TCRO to set overall commuter rail policies, to establish fares, to determine the extent of advertising necessary, and to establish and modify schedules with consultation and agreement by CSXT and Amtrak.
- CSXT agreed to use its best efforts in assisting FDOT/TCRO in managing the commuter rail system. It also designated a Vice President to coordinate commuter rail matters with both parties.
- CSXT agreed to operate the service in accordance with the consists and schedules established, to petition and prosecute all regulatory authority proceedings initiated in the corridor, to not initiate any new regulatory proceedings, to keep all records in connection with the operating phase of the service including train sheets, block records, shop reports, track maintenance records, and personal injury and train accident records.
- CSXT also agreed to maintain appropriate financial records reflecting CSXT's costs. FDOT/TCRO were required to compensate CSXT for all costs attributed to CSXT's provision of the contract service either at a flat rate established in the agreement or on an actual cost basis.

The costs of the Access and Service Agreement to the commuter rail service had it been implemented would have been as follows:

FIXED COSTS	
Rental of Railroad Property for Stations	\$157,261
Access/Maintenance Fee	
First Two Years	\$600,000
Third Year through the Fifth Year	\$720,000
VARIABLE COSTS	
Liability Insurance \$95,000,000 with \$5,000,000 State Self Insured	
First Year	\$3,800,000
Costs of CSXT property damaged and of wreck clearing resulting from commuter rail operations	
Costs of any rented equipment, such as locomotives	

The least desirable aspects of this agreement which FDOT/TCRO had to accept as a condition of providing a public transportation service on a privately owned railroad were as follows:

1. Amtrak's prior rights to use of the property and facilities. The most damaging of these was Amtrak's trains having priority over commuter trains and Amtrak's reluctance to adjust its schedules to accommodate improving the commuter operations.
2. The high cost of the liability insurance program.
3. Excessive labor rates and additives dictated by CSXT labor union contracts.
4. Excessive machinery rental rates established by CSXT and charged to outside parties for use of railroad maintenance machinery. CSXT conceded, however, to reduce the machinery rental charge by 20% for the major track and bridge rehabilitation required by CSXT before they authorized start of the commuter service.

The Access and Service Agreement, executed by CSXT and FDOT on June 9, 1987, was eventually superseded when the FDOT acquired the CSXT rail corridor on May 11, 1988.

D. Rail Corridor Acquisition

In the fall of 1986 the CSXT railroad indicated to FDOT that it was considering the sale of 200 miles of its railroad operating property and facilities from Sebring to Homestead. The CSXT's share of the freight market, primarily in the 81 miles between West Palm Beach and Miami, had steadily decreased from the late 1960's due to intense competition from the Florida East Coast Railway (FEC). Recognizing that the acquisition of this property could have broad implications on the existing and future transportation systems of the area, the planning division of FDOT established an interdisciplinary task force to identify and evaluate the implications of the sale. The task force recommended that FDOT proceed with negotiations to acquire the property based on the following benefits of public ownership and control of the property:

1. The Interstate 95 corridor in the three county area was then or would be, by the year 2000, bounded on the east by residential or commercial development and on the west by the CSXT railroad. Additional future expansion of I-95, the major north-south highway facility, would therefore require acquisition of highly developed properties or all or part of the CSXT rail corridor. It was estimated that right of way costs in developed areas adjacent to I-95 in the year 2000 would cost \$1 million or more per acre.
2. Commuter rail service on the CSXT rail property, proposed to supplement the capacity of I-95 during the construction of additional lanes, could become a permanent part of the region's transportation system.
3. The rail property passes through the Miami airport and is adjacent to the Fort Lauderdale and West Palm Beach airports. Its strategic location adjacent to three major airports and traversing from north to south the most heavily populated area in the state enhanced this one-time opportunity to acquire an already in place transportation corridor. The assemblage of such a corridor in the future would require a great deal of time and money or possibly could not be accomplished at all.
4. The continuation of rail freight service and competition between two freight railroads in the south Florida area was desirable. The acquisition would assure the corridor's availability for this transportation alternative.
5. The rail corridor provided an existing right of way for high speed rail to access south Florida. It represents approximately 21% of the 314 miles required for a high speed rail system between Tampa-Orlando-Miami.

Public ownership of the corridor would facilitate the use of the corridor for this mode.

6. The rail corridor was thought to be essential for the continuance of Amtrak rail passenger service to south Florida. Approximately 300,000 passengers per year travel between the northeastern cities of the United States and south Florida on Amtrak.
7. There was a major need to affect grade separation of numerous major streets and highways which currently cross the railroad at grade. Public ownership of the railroad was thought to facilitate this work. Grade separation of the entire route or major segments thereof was not beyond the realm of possibility in the future.
8. Sale of the corridor to a regional short line rail operator prior to the tri county commuter rail agreement would have complicated and possibly delayed the start up of commuter operations. It also would have required Amtrak and the future high speed rail franchisee to negotiate with the new owner which may not have been in the public interest.
9. Sale of the corridor to a high speed rail franchisee would possibly place the continuance of necessary freight service at a disadvantage and require the state to negotiate the commuter rail use of facilities with the high speed rail franchisee. This probably would not be in the best public interest.
10. The future appreciation of the real estate value of the corridor would accrue to the citizens of Florida.

In summary, public ownership of the corridor was considered necessary to assure maximum and economical use of the existing railroad right of way for the transportation requirements of the area. Under private ownership this could not be assured. FDOT proceeded with the necessary real estate and railroad fixed facilities appraisals on the property and negotiated a purchase agreement with CSXT. The acquisition rationale and proposed purchase agreement were presented to the Florida Legislature's transportation committees who concurred with the FDOT's recommendation that the corridor be acquired. The negotiated price for the 81 miles of railroad facilities on approximately 1150 acres of land was \$264,000,000, to be paid for with an initial down payment of \$75,000,000 and ten annual installment payments. The installment payments consist of four at \$25,000,000 each, five at \$40,000,000 each and a final payment of \$1,721,424.79. The 1988 Florida Legislature subsequently appropriated the initial \$75,000,000 and the purchase agreement was executed on May 11, 1988. Each subsequent session of the Legislature must annually appropriate each of the installment payments or the property reverts to the CSXT.

An Operating and Management Agreement, an exhibit to the purchase agreement, has a Phase A and a Phase B. The corridor is currently operating under Phase A, being maintained and operated by CSXT as the State's agent, wherein the CSXT has the common carrier freight provision obligations and maintains the tracks, signals, bridges, communication systems, and buildings with its employees. FDOT/TCRO maintains certain specified passenger stations excepting the areas maintained by Amtrak.

Under the agreement the cost of maintaining the state property is based on the proportionate use of the tracks by freight, commuter rail and Amtrak passenger trains. CSXT pays a per car mile charge for freight and Amtrak passenger trains into a maintenance fund. TCRO also pays a per car mile charge for commuter service facility and track maintenance. Capital improvements require mutual consent of the state and CSXT. CSXT also pays FDOT a fixed rental per month for use of the state property.

Phase B provides the CSXT with the option, after May 11, 1990, of selling the common carrier freight rights on the corridor to the FDOT, on a first right of refusal basis, or to a ready, willing and able purchaser who probably would be a regional rail carrier (short line operator) meeting the Interstate Commerce Commission's conditions for continuance of freight service. The purchaser, FDOT or a private party, would assume all of CSXT's responsibilities for providing freight service and maintaining the state-owned properties under the same terms and conditions as required in Phase A. CSXT would retain trackage rights across the state-owned corridor if they continue providing freight service between Miami and Homestead. CSXT also would retain Amtrak rights until 1996 and MCI Telecommunications and Lightnet rights until 2007 and 2018 respectively.

E. Miscellaneous Support Facilities and Equipment

In the Hialeah car shop and enginehouse areas it was necessary that certain existing or new facilities and equipment be modified, procured or constructed to maintain the locomotives and coaches as follows:

Facilities/Equipment	Costs
Office Renovations and Trailers at Hialeah.	\$85,371
Coach toilet clean out facilities.	\$20,000
Water and power to the coach yard.	\$8,809
Pavement between coach tracks.	\$13,468
Train power receptacles.	\$274,700
Provision of a bi-level coach washer.	\$145,467
Misc. storehouse modifications & a fork lift.	\$38,510
TOTAL	\$586,325

In addition a West Palm Beach layover base, including standby power receptacles and a small building and security fencing, were designed and constructed at a cost of \$840,188. The facility was built entirely on former railroad owned property which is now owned by the state. Additional tracks would have required condemnation and acquisition of expensive privately owned property. Therefore the decision was made to conserve budget and postpone expansion of the facility until operating experience verified actual need.

Also \$55,363 was spent to rebuild grade crossings and increase curve elevations to permit a speed increase from 35 mph to 79 mph on six miles of track south of West Palm Beach.

F. Insurance Requirements

As a condition of sale of the rail corridor to the state, CSXT required that they be held harmless from any property damage or personal injury liability connected with use of the property by, or through operation of, the commuter rail service as long as CSXT was to operate freight service. The CSXT required \$100,000,000 in personal injury liability insurance and \$15,000,000 in property damage insurance. The latter covered damage to commuter stations, commuter rail coaches and locomotives as well as damage to the railroad tracks, bridges, signals and communication systems.

The Florida Department of General Services (DGS) was responsible for procurement of insurance required in the implementation of state projects. DGS with FDOT assistance therefore developed insurance specifications and advertised for bids on September 22, 1987. Only two responses from brokerage firms, Johnson & Johnson, and Alexander & Alexander, were received. Neither firm was 100% responsive but Alexander & Alexander was the most responsive. DGS asked for and received permission from the Governor and Cabinet to negotiate with both brokerage firms. After negotiations, Alexander & Alexander were selected as the successful broker. The first policy issued on April 20, 1988 was the property damage policy in the amount of \$15,000,000 with a \$100,000 self insured retained amount. This policy covered the coaches and locomotives and enabled the operational equipment tests to be conducted on the railroad in October of 1988.

The personal injury liability portion of the insurance required negotiations with the prime underwriters, Lloyds of London, in London. At this meeting the premium for the level of coverage was determined. Lloyds of London also met a state requirement that all commercial insurance be underwritten by companies meeting DGS financial and other criteria used to evaluate companies. The personal injury liability insurance became effective June 1, 1988 and, with the above mentioned property damage insurance, enabled the equipment testing and qualification of train crews to proceed prior to the start of service on January 9, 1989.

The total premium for the personal injury liability insurance was \$3,300,000 the first year (1989). This rate was high due to the commuter system being new with no operating, accident or claims history on which to base the premium. In October of 1989, after nine months of operating experience, the insurance premium was renegotiated with Lloyds of London to \$2,875,000 for 1990. This was based on the excellent operating safety record for the first year of operations and represented a reduction of \$425,000 or 12.9%. The only accident experience in the first sixteen months of commuter rail operations, consisting primarily of grade crossing accidents, minor injuries to passengers, trespassers, and UTDC operating and maintenance employees, is summarized in Section 5.D.2.

IV. Passenger Stations and Rolling Stock

A. Station Design and Construction

The initial feasibility study and cost estimates were based on minimum cost stations constructed of black topped timber crib platforms utilizing readily available plexiglass bus type shelters and 50 car parking lots. These low cost stations were recommended given the possible five year duration of the service and to keep the capital costs as low as possible. The initial cost estimate used per station was \$250,000. The temporary station concept was not acceptable to the TCRO and general public who felt that concrete platforms with modernistic canopies and parking lots optimizing available station land areas were needed to stimulate ridership. Subsequently the stations were individually designed under the DeLeuw Cather contract at the direction of the TCRO and FDOT district office in Fort Lauderdale. DeLeuw Cather also provided construction inspection, supervised by FDOT and district construction managers. A standard station consisted of a concrete platform with canopies, a boarding ramp for the handicapped, a parking lot, and lighting.

Station locations and costs follow:

West Palm Beach Amtrak Overlay of existing platform and construction of a ramped handicapped access platform.

\$92,006

West Palm Beach Airport Standard station with a bus access lane.

\$178,176

Lake Worth Standard station with fencing separating it from an adjacent high school parking lot.

\$315,755

Boynton Beach Standard station with an access road leased on private property.

Not in service until December 1, 1989.

\$272,977

Delray Beach Temporary wooden platform and handicapped ramp built on existing Amtrak station platform. Amtrak station privately owned. Access to the Amtrak station is limited and a new station site at Lake Ida Road is under development with a budget of \$300,000

\$21,786

Boca Raton Standard station.

\$452,181

Deerfield Beach, Fort Lauderdale, and Hollywood Amtrak Overlay of existing platforms and construction of handicapped access platforms.

\$821,396

Pompano Beach Standard station.

\$584,154

Cypress Creek Standard station.

Not in service until June, 1989.

\$203,339

Fort Lauderdale Airport Standard station with double track platforms.

\$723,761

A portion of this station's platforms were in the clear zone of the Fort Lauderdale International Airport. Broward County subsequently relocated the station at county expense to an alternate location in July, 1989.

Golden Glades Standard station which utilizes an existing Dade County park and ride lot across State Route 9 from the railroad. This required an extensive pedestrian overpass.

\$959,494

Dade Metro at NW 79th Street A bi-level transfer station between the commuter rail service and the Dade Metro rail system. With the exception of parking facilities it is a full size, Dade Metro station with escalators, elevators for the handicapped and standard length double track Dade Metro platforms. Dade County contracted for the design and construction of the station. Budgeted at \$11,990,000, paid out as of March 15, 1990. \$10,882,309

Miami Airport Station Standard station.

\$245,892

Station Canopies Contracted for by FDOT.

\$171,183

Station Signing Contracted for by FDOT.

\$102,448

Total station cost as of March 15, 1990.

\$16,026,857

Budgeted for Delray Beach (not yet constructed)

\$300,000

Remaining to close out Metro Rail

\$1,107,691

The stations have been functional and well accepted by the public. There have been some complaints that the modernistic aesthetically designed canopies have not provided adequate protection from the sun and driving rain storms common to the

area. Also the number of parking spaces available at various stations have proven to be inadequate because the stations were built on limited available land owned by the railroad at each site. Because of the possible temporary nature of the project no other adjacent land was acquired for enlarging the parking lots.

Only three of the nine new stations constructed, excluding Dade Metro, came in under the average \$250,000 per station estimate in the feasibility study. This was primarily because many of the actual stations sites were not fixed at the time of the estimate. The preliminary estimates were order of magnitude based on a minimum station design without considering site-specific cost impacts. The initial station budget, not including Dade Metro, was \$2,580,000. The amount expended as of March 15, 1990, excluding the Dade Metro, was \$5,144,548.

B. Station Operations, Fare Collection and Revenue Contract

The decision was made by the TCRO in February of 1988 to request letters of interest for a competitive bid contract for the management and performance of ticket sales, revenue collection and revenue accounting. TCRO was assisted in issuing the request for letters of interest, in developing the RFP, in evaluating the responses and in negotiating the contract by James Stoetzel and Associates of Andover, Massachusetts under a consultant sub-contract with the DeLeuw Cather Co., the prime engineering contractor for the project. The TCRO also made the decision not to implement an unmanned station concept with ticket dispensing fare machines which were recommended by the feasibility study. This significantly increased station operating costs by twelve positions during the a.m. and p.m. operating periods of approximately 4 1/2 hours each. The rationale for doing this was that vandal proof ticket dispensing machines were not yet proven at unattended stations and that the automated ticket stock was considerably more expensive than manually sold stock. FDOT had budgeted \$500,000 with which to pioneer the use of automatic ticket machines in hardened concrete installations similar to those currently in use in bank night deposit facilities during unattended banking hours.

The response to the request for proposals was due on June 24, 1988. While nine letters of interest were received there was only one bidder on the request for proposals, the ATE Management and Service Company, Inc. (ATE) of Cincinnati, Ohio. With only six months remaining until the start up of service, sole bidder negotiations were begun with ATE.

The proposal submitted by ATE was reviewed, evaluated and negotiated by members of the TCRO board, the Executive Director of the TCRO, the Manager of Finance of the TCRO, with assistance from James Stoetzel and Associates, Inc. who was experienced in railroad commuter ticket sales and revenue accounting.

The ATE Management and Service Company's proposal as negotiated was executed on December 12, 1988, 28 days before the start up of service. The cost of the contract was \$991,306 per year. The ATE company had extensive experience in ticket sales and revenue accounting gained in the management and operation of major bus transit systems nationwide. The contract executed was for payment of the defined scope of services on a cost plus basis.

The contract consisted of eighteen Articles and five Exhibits summarized as follows:

Article One Description of the Commuter Rail Property

1. A general description of the railroad, the limits of the commuter service, number of commuter trains per day, and the days and hours of service.

2. Sales Locations. The fifteen locations where ticket sales are to be transacted, the agreed upon hours of operation at each station. The contractor is also required to make ticket sales available through employers and retail outlets.
3. Fare Structure. A flat fare system with a base price of \$2.00 for a one way ticket. The basic type of tickets offered:

One way fare A single ride ticket for one ride between any two stations for adults and children twelve years of age or older. Valid on any train.

One way half fare A single ride ticket available at 50% of the one way fare that allows for one ride between any two stations for patrons identified by TCRO as eligible for this fare.

Weekly pass A multiple ride pass that allows an unlimited number of rides between any two stations. Valid only for the week, month, and year for which issued. Cost, \$17 per week.

Monthly pass A multiple ride pass that allows an unlimited number of rides between any two stations. Valid only for the month and year issued. Cost, \$60 per month.

Article Two General Conditions

1. The contractor agreed to undertake and perform the following obligations:
 - A. Pick-up, distribute, control and sell all TCRO single-ride tickets and multi-ride passes.
 - B. Perform revenue collection procedures as designated by TCRO to assure accurate and timely collection of all service generated revenue.
 - C. Perform revenue accounting and preparation and issuance of regular revenue accounting reports.
2. TCRO must furnish to the contractor all TCRO owned or leased ticket

selling facilities including, but not limited to, ticketing structures, furniture, safes or cabinets.

3. All graphic displays, signs and promotional material provided by the contractor must conform to the TCRO design standards and be approved by TCRO prior to use. Contractor is responsible for routine cleanliness of station ticketing areas. TCRO is responsible for removal of trash from stations.
4. Contractor must maintain a professional and clean sales environment at each station. Notices are limited to bulletin boards which must be kept current. All schedule changes must also be posted currently.
5. Contractor cannot make alterations to the ticket sales area without prior authority from TCRO in writing and is required to take all reasonable precautions to protect the facilities from damage. Contractor is required to promptly notify TCRO of any vandalism, accident or fire.
6. TCRO has right at any time to audit the contractor's books or records pertaining to the sale of tickets or revenue accounting.
7. In the event additional stations are opened or existing stations closed the following procedures will be followed:
 - A. Station Openings. The TCRO will advise the contractor of the station location. The contractor will develop a sales plan and submit a cost estimate to perform the ticket sales. TCRO will notify the contractor of its acceptance of the cost estimate and issue a notice to commence sales at the location.
 - B. Station Closings. The TCRO will advise the contractor of the station closings and resultant decrease in the amount of the station operating contract. Contractor will advise TCRO of its concurrence with the cost reduction.
8. In the event of a railroad work stoppage the contractor will take the following action: secure all tickets, remove all cash, remove all portable equipment and property belonging to the TCRO or the contractor and place it in secure storage. Contractor will furlough without charge to TCRO all non-salaried personnel.
9. Contractor is responsible for all personnel policies, tax responsibilities, social security and health insurance, employee benefits, purchasing policies and administrative procedures applicable to the internal

operation of the contractor.

10. Any increase in the scope of services shall result in a corresponding increase in the cost of the contract. Any decrease in the scope of services shall result in a corresponding decrease in the cost of the contract.

Article 3 Access to Rail Facilities and Elements to be Provided by TCRO

1. Secure, from Amtrak, at no cost to the contractor, the right to jointly use the state owned Amtrak passenger stations.
2. Provide all security for the service property at TCRO's expense.
3. Vandalism to the rail facilities, including the ticketing facilities, shall be the responsibility of the TCRO and the contractor assumes no responsibility for vandalism unless it is an act of the contractors employee or subcontractor.

Article 4 Personnel - Contractor's Responsibilities

1. To employe all necessary personnel and not to retain anyone not satisfactory to TCRO.
2. Not to discriminate against any employee, or applicant for employment, because of race, color, creed, sex, age or natural origin.
3. Provides, as a cost of the contract, a policy of insurance protecting TCRO from loss or damage from the dishonest acts of the contractor's personnel.
4. Personnel employed as sales agents will be responsible for the sale of tickets, accounting for daily sales, proper preparation of deposits and other accounting tasks.
5. To establish and enforce a uniform dress code as established by TCRO. All uniforms are provided by TCRO at no cost to the contractor.

Article 5 Training - Contractor's Responsibilities

1. To instruct all personnel in proper sales policy, ticket issuance, application of fare tariffs, revenue collection procedures, customer relations and other procedures necessary to function. After the completion of the initial training the contractor is required to monitor each employee's performance and provide any additional training required.
2. The training consists of two phases:
 - A. Overall duties
Passenger relations
Passenger complaint handling
Passenger information
Work shifts
Safety
Security
Lost and found procedures
Emergency procedures
Discipline code
 - B. Ticket sales procedures
Accounting procedures
Preparation of deposits
Use of drop safes
Reporting procedures
TCRO tariffs

Article Six Contract Management

1. Contractor to designate, by name, one employee as General Manager to have full authority on behalf of the contractor over all services provided.
2. On or before the fifteenth day of each month the contractor is required to submit the following monthly management reports:
 - A. Job cost reporting, labor costing by station location, straight, guarantee and overtime cost, by job craft, and individual employees.
 - B. Accounts payable.
 - C. General ledger.
 - D. Income/expense statement, summaries by line item. Includes budget vs. actual and comparison over time capability.
 - E. Invoicing for ticket sales.

Article Seven

Ticket Sales

1. Ticket sales are to be conducted at the 15 station locations and by mail and telephone.
2. On a monthly basis, the TCRO supplies the contractor with an allotment of ticket stock sufficient for the estimated sales at all sales outlets. Contractor signs for the ticket stock. All tickets have a unique identification number printed on the face of each ticket. The contractor is responsible for the secure receipt, shipment and storage of all tickets in his possession.
3. Ticket sales hours correspond to the hours the stations are open.
4. The price of each ticket and pass is set by TCRO. No discounts or add-ons can be authorized by the contractor unless authorized by the TCRO.
5. All tickets are required to be stamped with the location, date and time of sale. This authenticates that the ticket was properly sold by an authorized agent. Safeguarding of the dating mechanisms is the responsibility of the agent and contractor.
6. The contractor is required to accept all forms of U.S. currency. Personal checks and credit cards may be used to purchase weekly and monthly passes. Bad checks are the responsibility of the TCRO for collection.
7. In the event that automatic ticket vending machines are installed, the servicing and maintenance of the machines will be treated as an additional service requiring additional compensation under the contract.
8. The contractor is responsible for the offering and operation of an option to purchase passes to patrons by mail and by telephone.
9. The contractor is responsible for offering an option to purchase tickets through employers and must provide adequate personnel to receive the orders, process them and perform the necessary revenue accounting.
10. The contractor is prohibited from selling anything other than tickets and passes. The contractor may be required by TCRO to sell other TRI-RAIL related merchandise.
11. The contractor is required to perform refunds in accordance with the established TCRO refund policy.

Article Eight

Revenue Collection

The contractor is responsible for remitting payment for all tickets and passes sold on an as-sold basis to the TCRO. The TCRO is responsible for the collection of all revenues from all sales locations on a daily basis and transfer of the funds to a bank. The contractor is responsible for preparing a revenue deposit on a weekly basis for all pass sales generated in the pass by mail and telephone program.

Article Nine

Revenue Accounting

1. The contractor is responsible for producing all reports and financial statements, detailing sales by type and location, on an IBM (or compatible) micro-computer in a format compatible to that used by TCRO.

2. The weekly and monthly sales report formats are as follows:

A. Weekly:

Sales by location.
Tickets sold by type and totals.
Revenue by tariff type and totals.
Ticket refunds by type and amounts.
Net sales revenue.
Record of deposits for sales revenues.
Reconciliation of sales and deposit reports.

B. Monthly:

Same as A. Weekly, above plus-Comparison of previous month and year.
Graphics illustrating comparison.
A one page, executive summary of sales activity, noting the reporting period, the sales accounted for and the net revenue deposited.

C. Accounting for Weekly and Monthly Passes.

Within fourteen days after the close of each month the contractor is required to provide TCRO with an analysis of weekly and monthly pass sales including the types, quantities issued and cash value by sales location including number sold and refunded.

Article Ten Liquidated Damages

The contract provides for assessing liquidated damages against the contractor for undesirable performance or failure to perform to TCRO established safety and operational standards. TCRO has the right to monitor the contractor's compliance with the standards and must notify the contractor within 24 hours of a violation. If a safety violation, it must be corrected within 24 hours. Non safety violations must be corrected within five days after the violation has been verified. The following incidents result in liquidated damage payments to the TCRO:

1. Safety violations - \$500.
2. Late opening or early closing of a station - \$100.
3. Ticket stock outage - \$50.
4. Violation of the dress code - \$25.
5. Failure to have a revenue deposit ready - \$250.

Article Eleven Compensation and Method of Invoicing

The contractor shall submit bills on a monthly basis for services authorized to be performed. The amount required to provide the services outlined in the contract is estimated to be \$991,306. TCRO is not obligated to reimburse the contractor for costs incurred in excess of the estimated costs. The contractor submits invoices monthly and TCRO makes its best effort to pay within 45 days. The combined allowance for administrative overhead and fringe benefits cannot exceed 135%. State sales tax is not billable.

Article Twelve Liability and Insurance

ATE in lieu of a specific insurance obligation in the contract is indemnified and saved harmless by TCRO under the \$100,000,000 insurance policy obtained by the FDOT from Lloyds of London. The contractor is required to maintain insurance for all purposes associated with insurance necessary for workers compensation, for protection of the premises occupied by the contractor, and insurance of automobile usage by it's employees in performance of their duties required by the contract. TCRO is required to defend, indemnify and save harmless the contractor from any and all liability for injury or death of any contractor employee on duty employed in the operation of the contract service. The contractor is also held harmless by TCRO from any liability for injury to or death of any commuter rail passenger, or for loss of, damage to, or destruction of any passenger's property.

Article Thirteen Audit and Inspection of Books and Records

The contractor is required to keep detailed written records of all services performed under the contract and make them readily available.

Article Fourteen Arbitration

Disputes concerning the interpretation, application, or implementation of the Articles and subject matter of the contract are to be submitted to binding arbitration under the rules of the American Arbitration Association.

Article Fifteen Payment Limitation

The TCRO is required to advise the contractor with respect to the amount of funds available for expenditure during the next fiscal year for performance of the service and payment to the contractor.

Article Sixteen Non-Discrimination and Other Legal Requirements

The contractor was required to comply with all state and federal laws and regulations pertaining to non-discrimination in employment as well as with applicable federal and state laws concerning the environment. The DBE goal for this contract was established at 10%. In the event the contractor fails to meet this requirement the TCRO may terminate the agreement.

Article Seventeen Term and Termination

The initial term of the agreement is for twelve months with the TCRO having the option to renew for up to two additional one year terms. The TCRO may terminate the agreement upon ten days notice under certain conditions.

Further the TCRO has the right to terminate the contract at it's convenience. Termination for convenience creates no obligation on the part of the TCRO except for payment for work completed as of the date of termination.

Article Eighteen General Provisions

he contract contains a standard Force Majeure clause.

Any labor protection obligations of the contractor are not applicable to this agreement or payable by TCRO.

C. Acquisition of Locomotives

The Florida Department of Transportation (FDOT), assisted by the railroad engineering consulting firm of DeLeuw Cather and Co., made the decision in September, 1986 to issue a request for proposals for competitive bids for new F-40 PH-2 passenger locomotives, or rebuilt second hand EMD GP-40 freight locomotives, converted to F-40 PH-2 passenger locomotives. This decision was reached after determining that the F-40-PH-2 met the operating characteristics and service requirements of the commuter service. The second hand GP-40 freight units were readily available and could be rebuilt in time to meet the then proposed start up date of July 1, 1988. The Maryland DOT and New Jersey Transit Authority both had contracts in process at the time FDOT made the decision to proceed with a request for proposals. A considerable savings in time and money accrued to the project because specifications were available and could be modified to include several options FDOT desired. New locomotives were also included in the bidding at the request of General Motors and General Electric companies who designed and built new locomotives and spare parts for existing locomotives.

The request for proposals was for five locomotives with an option for a sixth, to be delivered during the sixth year of operation. The locomotives were to be equipped with electric power generators for supplying power to the train and driven from the main 3000 hp diesel engine on the locomotive. The locomotives also were to be controlled in the push mode from a passenger coach on the end of the train equipped with a locomotive control cab.

Given the possibility that the service might terminate after five years if the ridership did not warrant continuance, FDOT included in the request for proposals four different purchase and lease options as follows:

- | | |
|--------------|--|
| Option One | Outright purchase of the locomotives. |
| Option Two | A five year lease with FDOT ownership after the five years. |
| Option Three | A five year lease with FDOT ownership after five years and with repurchase by the manufacturer after the five years for the residual value. |
| Option Four | A initial five year lease with option for an additional five years with FDOT having the right to acquire ownership for the residual value at the end of the sixth through ninth year respectively. |

There were three respondents to the proposal for rebuilding the locomotives and two for supplying new locomotives. The rebuilders were Chrome Locomotive Inc. of Silvia, Illinois, Peaker Services Inc. of Chicago and Morrison Knudsen Inc. of Boise, Idaho. General Motors and General Electric responded to the request for new locomotives. Bids were received from Morrison Knudsen, Chrome Locomotive and General Motors.

After analyzing the economics of the various options and resale potential a decision was made for Option One, out right purchase of rebuilt locomotives. Morrison Knudsen Inc. were awarded the contract on April 10, 1987 at a price of \$4,297,885 for the five locomotives and \$387,698 for spare parts. This equates to a price per locomotive with spare parts of \$937,117. Chrome Locomotive's bid was for \$5,180,000 or \$1,036,000 per locomotive. General Motors bid \$1,450,000 per new locomotive. FDOT had until December 1, 1987 to pick up the sixth locomotive but did not elect to do so.

As originally scheduled all five units were to be delivered between March 1, 1988 and March 31, 1988 at Hialeah Florida. When the start up of service was postponed from July 1, 1988 to January, 1989 Morrison Knudsen requested to move the delivery dates forward to accommodate other production units on their assembly line. FDOT agreed to this to avoid having to store the locomotives at Hialeah from March to September when road tests of the train sets were scheduled to begin. Title to each locomotive and its warranty began with the locomotives delivery and acceptance at Hialeah. The first locomotive arrived in Hialeah on May 2, 1988 and the last on August 23, 1988. With change orders the final contract price for the five locomotives was \$4,707,777 or \$941,555 each.

D. Acquisition of Passenger Coaches

The acquisition process for passenger coaches began in May of 1985. The feasibility study recommended the use of high capacity bi-level coaches operated in the push-pull mode. There were several reasons for this recommendation: to keep train lengths at a minimum in order to realize the economics of shorter station platform requirements; to maximize passenger capacity per train length and minimize coach running gear maintenance; to avoid the time required to turn the trains; and to avoid the cost of constructing a wye track to turn the trains at the north end of the system. Another advantage was that bi-level coaches and cab coaches were under construction by Suminoto of Japan for the California Department of Transportation (Caltrans) commuter service on the Southern Pacific Railroad between San Jose and San Francisco. Also the Urban Transportation Development Corporation (UTDC) of Canada was in the process of setting up a production line in Thunder Bay, Ontario, operated by its subsidiary Cancar, to produce 68 bi-level coaches in 1986 for commuter rail service in Toronto. This meant that specifications existed that could be modified to meet Florida's requirements at a considerable time and cost savings. Also considerable economies of scale could be obtained by programming Florida coaches with material and part orders already on production lines which were up and running with experienced personnel.

The UTDC coaches being produced for Toronto were an improved second generation of coaches first produced and placed in service in 1978 with outstanding results. Both the Suminoto and UTDC coaches presented no overhead clearance, side clearance, or curvature problems on the railroad between West Palm Beach and Miami.

FDOT also looked at acquiring used bi-level coaches being retired and replaced with the Suminoto coaches by Caltrans. Caltrans was replacing 46 coaches constructed by Pullman Standard and seating 145 to 164 passengers per coach with 56 new coaches seating 148 passengers per coach. These new coaches were funded with an Urban Mass Transportation Administration grant. The coach shells were produced in Japan and final assembled and trucked in San Francisco by the General Electric Co., a sub-contractor. Ten of the old coaches were 36 years old, 21 were 29 years old, and 15 were 16 years old. Caltrans was required to sell the old coaches using an advertised competitive bid. FDOT, whose requirements were twelve coaches and six cab coaches, would have had to submit the high bid on each coach it wanted in order to obtain them. The coaches all required major rehabilitation to their interiors and running gear to make them acceptable for the start up of a new service. The used Caltran and new Suminoto coaches had a first level floor height of 42" and 44" respectively, above the top of rail. This meant that passengers boarding the coaches on an at grade platform would have had to negotiate three steps to reach the first seating level of the coaches. The coaches could not be boarded by

a handicapped person in a wheel chair or by a person who could not negotiate steps unless high level platforms and vestibule aprons were provided or the coaches equipped with elevators to lift the handicapped passenger from low level platforms to the coach floor height. The UTDC coaches had a first level floor height of 25" above the top of rail. This meant, that by constructing a 13" ramped overlay on top of an existing low level platform, which is 8" above the top of rail, a light weight portable aluminum ramp stored in the coaches could be used to ramp the remaining 4" to the coach floor. This met the slope requirements established for wheel chairs and other handicapped person's ramps. In the coach, immediately adjacent to the coach door, on a transverse bulkhead, there was room for two wheel chairs with hold down devices. Because of the time required and high cost of providing 15 high level platforms or designing and installing elevators in the Caltrans and Suminoto coaches a recommendation was made by the FDOT and approved by TCRO to justify and secure authority from the Florida Department of General Services (DGS) to negotiate a sole source contract with UTDC.

The sole source contract was justified based on the following:

1. The UTDC coach was the only bi-level coach whose design permitted minimum cost access for the handicapped.
2. The coach order could be completed in time to meet the proposed start-up date of the Florida system.
3. UTDC agreed to buy back the coaches at the end of five years if the commuter system was discontinued.
4. The basic coach design had a proven operational and maintenance record on the Toronto system.
5. New rather than used equipment was estimated to increase ridership by ten percent.

DGS approved FDOT's request for a sole source contract. The contract was negotiated accordingly and executed on July 29, 1986. The price per coach was \$975,000 with a buy back option to be exercised by FDOT/TCRO at the end of the third year with the coaches returned by the end of the fifth year. The buy back was to be \$600,000 per coach if the commuter rail service terminated and \$400,000 if the service continued using other equipment. FDOT/TCRO was required to maintain the coaches to standards established by UTDC. The condition of the coaches was to be verified annually by an independent qualified railroad passenger coach inspector.

The coaches were warranted as follows:

Coach Part	Warranty Period
Carbody Structure	Five Years
Truck Frames	Five Years
Air Conditioners	Two Years
All Other Equipment	One Year

The contract price of \$17,550,000 was paid out as follows:

Pay Out Schedule	
\$2,632,500	upon mobilization
\$4,387,500	at 25% completion
\$1,755,000	at 75% completion
\$7,020,000	upon delivery of coaches at Hialeah (\$390,000 per coach)
\$1,755,000	upon final acceptance of coaches (\$97,500 per coach)

With spare parts, change orders and the decision to purchase a sixth cab car and one less trailer coach, the final contract amount was \$18,374,900.

A coach delivery schedule was established in the contract requiring the first coach to be in Hialeah on April 1, 1988 and the last coach by August 1, 1988. A \$400 per day per coach late delivery penalty was established in the contract. The first coach was delivered on April 18, 1988 and the last on October 30, 1988, two months prior to the start up of service. Over the duration of the contract the total penalty days on the eighteen coaches were 674, resulting in a payment credit of \$269,600.

After the correction of several initial problems and fourteen months in service the coaches have proven to be reliable and generally acceptable to the public. Problems which developed after delivery and were corrected at UTDC expense were:

1. The coaches had to be repainted because they did not stand up to the high ambient temperatures and humidity of south Florida.

2. The rubber gaskets around the windows had to be replaced because they did not seal properly causing the windows to fog. This was attributed to a manufacturing failure in the production of the gaskets and was corrected by replacement of the gaskets.
3. When stored without air conditioning, certain ceiling and side panels failed because of incorrect size and heat expansion.
4. The grab irons on the corners of the coaches did not meet FRA requirements and had to be replaced.
5. The fiber glass toilet modules in all coaches needed replacing due to cracking.

V. Operations and Management of the Service

CSXT, from the beginning of commuter rail negotiations, indicated they did not wish to operate the service or maintain the equipment. Initially CSXT, before the corridor was acquired by FDOT, required Amtrak to be the operating contractor. This position by CSXT forced FDOT/TCRO into negotiating a sole source contract with Amtrak. CSXT's refusal to operate the service and FDOT's failure to come to terms with Amtrak, as outlined in part B of this section, resulted in FDOT/TCRO entering into multiple contracts for train operations, station operations, revenue accounting and security. This was undesirable in that it resulted in a complex administrative framework.

A. Amtrak Negotiations

Train and engine personnel employed by Amtrak were operating the intercity passenger trains between Boston, New York, Washington D.C. and Miami. Amtrak also, since its inception in 1970, had contracted with CSXT or its predecessor company, for union employees to maintain Amtrak trains in the Hialeah yard facility. Amtrak also maintained existing passenger stations at West Palm Beach, Delray Beach, Deerfield Beach, Fort Lauderdale, Hollywood and Miami. Ticket sales and revenue accounting were performed at these manned stations. Amtrak was therefore considered to be qualified to contract for train operations, train maintenance, station operations and revenue accounting.

Amtrak was willing to provide these services and FDOT, assisted by L. E. Peabody and Associates, a firm noted for the negotiation of commuter and other railroad agreements, began negotiations for a sole source operating contract with Amtrak in 1986. The negotiations went on for over a year and a half and a detailed and comprehensive agreement was drawn up and thought ready for execution. This did not prove to be the case because Amtrak insisted on two conditions which FDOT/TCRO could not meet. These were the requirements that Amtrak not be held liable for the action of their own employees and that any existing or newly hired employees be subject to Amtrak's current job protection agreement with its labor unions. The possibility that the commuter service would be discontinued after five years made the job protection requirement totally unacceptable. Three additional months were spent trying to resolve these issues to no avail. The negotiations with Amtrak were discontinued in March of 1988 and a scope of services and request for proposals to operate the service was subsequently advertised.

B. Train Operations and Equipment Maintenance Contract

A two day meeting with prospective bidders in Fort Lauderdale was held on June 23rd and 24th. Five potential bidders attended the pre-bid conference. The first day consisted of a bus tour of the railroad between West Palm Beach and Miami to inspect the physical characteristics and condition of the railroad. The second day of the meeting was to answer any questions the prospective bidders had on any aspect of the proposed scope of work. The responses to the advertisement for proposals were received by July 8, 1988.

A summary of the scope of services on which the respondents bid for a three year contract period, with two additional years at the state's option, included the following:

1. The management of the commuter rail service and liaison on all service matters with FDOT/TCRO.
2. The day-to-day operational supervision and reporting on all service elements.
3. The employment of the necessary train crews, locomotive and coach maintenance personnel. The FDOT/TCRO were to be held harmless by the employer from any labor protection liability incurred from operation of the service or maintenance of the equipment.
4. The maintenance of the locomotives and coaches.
5. The maintenance and operations of the West Palm Beach layover facility.
6. The maintenance of the commuter rail stations, excluding the Amtrak portions of West Palm Beach, Delray Beach, Deerfield Beach, Fort Lauderdale, Hollywood, and the Dade Metro station.
7. The financial management of the operating contract, including the preparation and management of an operating budget and financial status reporting.
8. The development and implementation of a system safety plan certifiable by FDOT/TCRO including compliance therewith.
9. The personnel management and discipline of all operating and maintenance employees under the operating contract.

10. Procurement, disbursement, and accounting for the material necessary to operate and maintain the equipment and facilities specified in the contract, excluding fuel which was purchased by the state and the tracks, signals, and bridges maintained by the CSXT under the provisions of the FDOT corridor purchase and operating and management agreements.
11. Coordination with the feeder bus systems established by the Counties, Dade Metro-Rail and all other agencies providing transportation services complimenting the commuter rail operations.

The request for proposals also required the operating contractor to meet operating and safety standards or be penalized. These included:

1. A minimum monthly on time performance for all revenue trains of 98%.
2. No more than twelve verified patron complaints registered against the operator's employees for each calendar year of the contract term.
3. The development, implementation and enforcement of an efficiency check program to assure that the trains were operated in accordance with the CSXT operating rules. This program was necessary to meet the requirements of the Federal Railroad Administration and FDOT.
4. The certification of, and compliance with, the system safety plan required of public transportation agencies by Florida statutes.

The request for proposals also requested the respondents provide, as an option in their submission, an item for the provision of commuter rail station security. This did not include on-board train security, which in the request for proposals, was to be provided by the conductors, assistant conductors or by the proof of fare payment officers provided by the TCRO. Also excluded as part of the operating contract was the cost of providing for the two shifts of train dispatchers required in the CSXT's dispatch center in Jacksonville and the three shifts of bridge tenders at the New River Drawbridge in Fort Lauderdale. These positions were exempted because they were CSXT employees paid under the corridor purchase and operating and management agreements.

The contract operator was required to maintain the locomotives to the manufacturer's warranty provisions and to the maintenance of equipment standards developed by FDOT under the DeLeuw Cather consultant contract. The coaches were to be maintained to the manufacturer's warranty provisions, the buy back provisions specified in the coach purchase agreement between UTDC and FDOT and to the FDOT maintenance of equipment standards.

Other factors which influenced the contractor's proposal in the equipment maintenance area were:

1. Amtrak owned and operated a wheel truing machine in Hialeah yard. FDOT/TCRO reached agreement with Amtrak for use of this machine to true commuter car wheels at a fixed price to the contractor. The respondents were therefore not required to provide a wheel truing facility but only to bid on the payment to Amtrak for truing wheels in their facility. Amtrak's price per wheel set was \$150.
2. Amtrak also maintained a store house in a state owned building in Hialeah. Initially Amtrak agreed that there was sufficient available space in the existing building to accommodate the commuter rail storage requirements. The respondents therefore were not required to bid on providing a storage building and FDOT agreed, with Amtrak's concurrence, to provide and pay for the necessary modifications. (Amtrak subsequently refused to provide the required commuter rail space and FDOT had to modify space in the enginehouse to provide for commuter rail needs).
3. The cost of providing train and engine crews and operating the train sets during 27 days of equipment acceptance testing.
4. The maintenance of 100% air conditioner performance.
5. Daily cleaning and servicing of the coaches was required at Hialeah and at the West Palm Beach layover facility.
6. The respondents were to bid on two car washing options. Washing the cars by hand or by using the existing state owned car washer used and maintained by Amtrak at Hialeah. The Amtrak washer did not prove feasible because it did not cover the top and bottom two feet of the bi-level cars nor did it wash the top of the bi-levels. Also the washing detergent used by Amtrak could not be used on the special paint used on the aluminum side sheeting of the bi-levels. FDOT subsequently contracted for construction of a bi-level car washer, and in the interim, the contractor washed the cars by hand.
7. The contract required the operator to clean the interior and service the trains laid over nightly at West Palm Beach.
8. The only facility maintenance required by the operator at the Hialeah locomotive and coach maintenance facility was the routine janitorial service required in the contractor's offices, crew locker and lunch rooms.

The contract was to be bid on a lump sum basis rather than cost plus. A lump sum price for each of the five years was to be bid in constant dollars. The decision for a lump sum contract, rather than a cost plus contract, was based on FDOT's experience with the escalation of complex railroad contracts after award. Another factor was the time and cost of personnel required to manage cost plus contracts.

The bidders also were advised consideration would be given to an incentive payment clause and a penalty clause for above or below a 98% on time performance level.

The initial cost of training the coach repairmen and qualifying the train crews was to be borne by FDOT/TCRO. Subsequent training was to be borne by the contract operator. The coach buy back agreement required a specified level of training for the coach repairmen and CSXT/FDOT/TCRO required that all trainmen be qualified on the railroad's book of operating rules, special instructions, and safety rules.

In addition to the above considerations the proposals were required to contain:

1. Identification of any anticipated problems in providing the service.
2. A description of any innovative practices or methods which would be implemented.
3. A description and plan for providing the service from Hialeah, Florida
4. A description of the respondent's current resources available to implement the services and a listing of additional staff or other resources required.
5. A description of how the respondent would meet the equal employment opportunity and minority business requirements specified by FDOT/TCRO.
6. A description and plan of how the respondent proposed to address labor practices, unions and union agreements, including any ramifications of providing the services on the same property utilized by Amtrak and CSXT.
7. A description and plan of how the respondent proposed to hire and train any new employees necessary to implement the service. Respondents were required to furnish copies of any existing or proposed labor agreements under which services would be provided.
8. A statement of the number of days required for start up of service after receipt of notice to proceed.

9. Anticipated mobilization costs and a proposal for recovery.
10. A copy of the respondents latest audit for pre-contract audit purposes.

There were three responses to the request for proposals as follows:

1. The A.T.E. Management & Service Co. (ATE) of Cincinnati, Ohio.
2. The Urban Transportation Development Co. (UTDC) of Detroit, Michigan.
3. The Merchants Management Co. (MMC) of O'fallon, Illinois.

The proposals were reviewed and evaluated by a three member committee consisting of two railroad professional engineers from the FDOT Rail Bureau in Tallahassee and a consultant experienced in commuter rail operations who represented the FDOT district office. The TCRO declined to participate in the evaluation because its executive director was a former employee of the Urban Transportation Development Corporation.

The criteria used to rank the proposals and their respective weighted percentages were:

1. The quality and structure of the response to the scope of services and the comprehensiveness of the approach to the tasks - 30 %.
2. The level of detail and reasonableness of the cost package for each of the contract's five years - 20 %.
3. The degree of the proposer's past and current experience in commuter rail operations and management with resumes of personnel to be used in the project supporting this experience - 25 %.
4. A description of the innovative management and technical approaches to be used in operating and maintaining the facilities and equipment - 20 %.
5. Compliance with the 10% minority business enterprise and equal opportunity employment requirements - 5 %.

The selection committee ranked UTDC # 1, ATE # 2, and MMC # 3. Before negotiations were begun with UTDC, the Merchants Management Co. withdrew its bid because it was unable to secure the performance bond required to secure the contract. The bond was in the amount of the full contract price bid for the first three

years of the contract service.

UTDC's proposal was superior to ATE's in the following areas:

1. UTDC's response to the scope of services was in greater detail and reflected considerably more railroad operating knowledge and experience than ATE's. UTDC's knowledge of the project was superior to ATE's. While ATE's proposal reflected its strong transit system management experience, primarily in the bus area, UTDC's operating proposal indicated superior and greater experience in commuter rail operations on an existing railroad, commuter rail equipment maintenance, and in railroad safety.
2. UTDC's cost proposal for the five year operating period was \$27,680,454, or \$25.45 per train mile, to provide 217,568 train miles per year versus ATE's cost proposal of \$32,870,540, or \$30.22 per train mile.

A comparison of the two bids follows:

Bid Item	ATE	UTDC
Five years of service including mobilization, training and security	\$36,609,599	\$33,403,374
Minus the security option	declined to bid	(\$3,324,420)
Minus diesel Fuel	(\$3,739,059)	(\$2,398,500)
Net Price Bid	\$32,870,540	\$27,680,454
Average price per year	\$6,574,108	\$5,536,091
Difference	\$1,038,017	

Diesel locomotive fuel was withdrawn from the bid because fuel could be obtained by FDOT at considerably less cost on FDOT's annual competitive fuel requisition bid. This proved to be a very cost effective decision. In the first calendar year of operations, January 9, 1989 to January, 1990, 770,319 gallons of diesel fuel were used, at an average price of 52 cents per gallon, for a total of \$400,566. The low bid by UTDC for provision of fuel was \$479,700 per year.

The bids were based on the operation of four train sets, five days per week. The schedule generated 836.8 train miles per day or 217,568 train miles per year.

The contract was negotiated during the last two weeks of September, 1988 and UTDC was given notice to proceed with the mobilization phase of the service on September 27, 1988. UTDC accepted the notice to proceed on October 6, 1988 and agreed that service would start on January 9, 1989.

The terms and application of the operating contract have been a source of controversy since the start up of service. A major issue which arose was the actual cost of providing the service compared to the lump sum price being paid to UTDC. The lump sum price included the cost of contingent liabilities, such as labor protection, which UTDC agreed to assume. When these liabilities did not materialize after the first year of operation, the difference between the actual cost of providing the service and the fixed payment was perceived to be inordinately high.

Another major issue which subsequently arose was the cost of providing additional train service over and above the basic level of service required by the contract. The lump sum contract designated the schedule which was to be operated for the bid price. While it also provided for negotiating the cost of any additional services required in the future, the contract did not specify a method for doing so. The contract also was not specific enough in detailing the number of trainmen and equipment maintenance personnel that were to be employed for the lump sum price. The contractor subsequently used these omissions to reduce the number of train crews and equipment maintenance workers actually employed. This increased the contractor's return and created controversy when the contractor insisted on additional compensation for operation of the mid-day train, which was added in January of 1990.

The level of controversy over the contract issues reached the point in March of 1990 where the TCRA governing board voted to terminate UTDC's contract. There is a provision in the contract where the contract can be cancelled at anytime upon payment to the contractor of the actual costs of demobilization, as approved by the state, plus 15% of the general and administrative costs of the demobilization. In response, UTDC offered to renegotiate the controversial provisions of the contract.

The contract was amended in January, 1990 when a noon day train was added. Also effective April 1, 1990, new schedules went into effect providing for four trains in each direction in the a.m., and six trains in each direction in the p.m., with all trains making each station between West Palm Beach and Miami Airport. This schedule generates (20 x 66.4 or) 1328 train miles per day which equates to 345,280 per year. The contract price was increased by \$217,000 per year to compensate for the addition of the noon day train. The average yearly price of the new contract is \$5,757,945.

C. Feeder/Distributor Bus System

The start up of the first commuter rail system in south Florida created the need for a feeder bus system to assure access of patrons to the rail service at both ends of the rail trip. The bus system serves as a feeder system at the entering end of the rail trip and as a distributing system at the leaving end. The Florida legislature required each of the three counties to develop and implement a feeder bus system to fully support the commuter rail system and ensure maximum ridership.

1. Planning

The system was planned and implemented by coordination between TCRO, the planning and transit organizations of the three counties, and the Florida Department of Transportation's district and central offices. A feeder bus planning study for Palm Beach county was done by Barton-Aschman and Associates, as a sub-contract under the DeLeuw Cather contract. The feeder bus plans for Broward and Dade counties were developed by the respective county planning and transit staffs.

Certain criteria were already established when the planning studies began. These were:

- The extent of the system, 66.4 miles with 15 stations.
- The train schedules were fixed, the buses had to conform to the arrival and departure times of the trains. However, minor adjustments were made to the train schedules during the bus planning period.
- The majority of the station areas were fixed and some were not conducive to good feeder bus circulation.

The bus service requirements were difficult to evaluate and estimate because:

- There was limited information available on which to predict the number of potential train riders.
- With the train service being a first in south Florida there was no experience on which to pattern the bus service from known ridership patterns.

- The willingness of potential rail patrons to ride the buses was unknown.
- It was unknown where the rail patrons wanted to go except in certain high employment areas where a bus market could be easily identified.
- The volume of residential ridership the system would attract at the entering end of the rail trip was difficult to predict.
- The bus systems were planned and contracted for before the start up of rail service based entirely on estimated data. This meant that once rail service began the bus systems would have to be adjusted and modified as rail ridership patterns and destination locations became known.

In the early stages of the commuter rail bus system planning the counties recognized that the route requirements necessary to support the commuter rail system were not compatible with those of the existing county transit bus systems. The commuter rail service required precise bus arrival times at the train stations and the rail route geography did not match the existing residential population and employment centers which the existing bus routes were designed to serve. The counties were unwilling to make modifications to rearrange their existing established bus routes or to provide sufficient new routes to accommodate the rail feeder bus system requirements. County owned buses also were not available to make the modifications. This meant, that if the county bus systems were to expand and provide the rail system's needs with county owned buses, major capital funds would be required with which to purchase buses. Implementation time was also a major factor influencing county decisions. The counties were not provided operating or capital funds by the legislature for the commuter rail bus systems, therefore without funds to purchase buses, Palm Beach and Broward counties made the decision to provide the bus service, mandated by the legislature, by contracting with private service providers.

Palm Beach County and Broward County prepared a request for proposals and a scope of services and competitively bid for a provider. Dade County, however, provided service only to the Miami Airport station on two routes using two existing county buses and staff. All three counties made the decision to provide access to the handicapped in the same manner in which it was provided on their established bus transit systems. This is by 24 hour advance notice on lift equipped buses.

2. Funding

To assist the counties the Florida Department of Transportation's Division of Public Transportation Operations entered into a joint participation agreement with the three counties on March 30, 1989 which defined funding assistance. In the agreement a total bus system cost, based on the counties' estimated planning needs, was specified as \$3,386,000 for 1989/1990. Participation was distributed as follows:

County	Cost	Percent	FDOT Participation
Palm Beach	\$1,056,000	31.46%	\$312,000
Broward	\$1,800,000	53.64%	\$532,000
Dade	\$500,000	14.90%	\$156,000
Total	\$3,356,000		\$1,000,000

3. Bus Contracts

A. Broward County

The county entered into a contract for the provision of bus service on December 20, 1988 with Aircar-Norman Inc. Compensation for the services, beginning on January 9, 1989, was based on the daily total number of bus hours of service provided in a five day week. The hourly cost per bus varies with bus size as follows:

Vehicle Size	Hourly Rate per Bus	Conditions
49-53 Passenger Bus (large)	\$65.01	
11 & 14 Passenger Van	\$28.00	Three hour am/pm minimum
20-30 Passenger Bus (based on vehicle cost)		
\$50,000-\$75,000	\$40.00	Three hour am/pm minimum
\$75,001-\$100,000	\$45.00	Three hour am/pm minimum
Greater than \$100,000	\$50.00	Three hour am/pm minimum

Other major provisions of the contract are:

1. Contractor will provide two field supervisors.
2. Deductions in payments are provided for failure to complete trips and failure to meet on time performance.
3. Contractor may lease county buses if and when available.
4. Fuel costs will be reviewed quarterly and bus hourly rates adjusted up or down.
5. Contractor is required to provide \$1,000,000 bodily injury and property damage insurance per occurrence.
6. Contractor must indemnify and save harmless county, its agents and employees, from or on account of any injuries or damages received or sustained by any person or persons resulting from Contractor's operations in implementation of the service.
7. Service may be terminated for cause or convenience upon 30 days notice.

As of May 1, 1990 Aircar-Norman Inc. under contract to Broward County is utilizing 20 buses per day, making 160 trips covering 1,177 miles on 16 routes, and serving five stations. The average cost per day is \$5,700. Broward County Transit provides service to the Hollywood station with its regular bus service on Hollywood Blvd. with a bus stopping, at the station, every 30 minutes.

B. Palm Beach County

This county also requested proposals for provision of the bus service similar to Broward County and on November 22, 1988 entered into a contract with National Transit Services Inc. The contract provides for compensation at the rate of \$46.00 per bus per revenue hour. This rate is based on an average per bus usage of six (6) hours per day, five days per week (less holidays) and a minimum of ten buses. The county's maximum obligation under the contract for one year of service is \$1,055,700. A revenue hour is defined as the time a bus is in service from its first point of service through its last point of service on each run. Deadhead time to and from the contractor's bus maintenance garage does not count as revenue time eligible for compensation. The hourly rate includes all costs and expenses incurred by the contractor providing the service. The contract also has provisions for penalizing the contractor for failure to complete trips and meet on time performance.

This contract also may be terminated with or without cause upon 30 days written

notice to the contractor. Liability insurance and indemnification are the same as the Broward county requirements. The contractor is utilizing 18 buses per day, making 149 trips on ten routes, while serving six stations. The average cost per day is \$5300.

C. Dade County

There are three commuter rail stations in Dade county. Miami Airport is the only rail station that Dade county chose to provide with feeder bus service. The Dade Metro station at Northwest 79th Street and the railroad is an interchange station between the commuter rail service and Dade Metro. Dade County does not provide feeder bus service to Dade Metro because the county considers Dade Metro as the only feeder service necessary for the commuter rail. Dade County does not believe any additional feeder bus service is required. This position forces any commuter rail patron in the Hialeah and Hialeah Springs areas to take a Dade county transit bus south to the Dade Metro system and to transfer again to the commuter rail system to reach his or her commuter rail destinations.

The Golden Glades rail station, which also serves Opa-locka, has access to the largest park and ride lot of any of the commuter rail stations. This facility was built for peak hour express bus service using dedicated lanes on Interstate 95 to downtown Miami. The lanes are also available to automobiles with two or more people during peak hours. The rail service is accessible to the parking lot by an overhead pedestrian bridge across State Road #9 constructed as part of the commuter rail project. In the commuter rail feasibility study it was proposed that the express bus service on I-95, which is operated at a considerable deficit, be stopped and the commuter rail service assume the ridership from the Golden Glades rail station to the Dade Metro/commuter rail station at Northwest 79th St.. From there patrons would transfer to their Dade Metro destination stations. This concept was not acceptable to Dade county because the rail trip time was ten minutes longer than the bus time and because the rail trip introduced an additional transfer. The benefits of this proposal would have been a reduction of bus congestion in the Miami Central Business District and on I-95 and, potentially, additional rail patronage.

The city of Opa-locka requested and was a candidate for a down town commuter rail station but was not granted a station because the Golden Glades station is on the eastern edge of Opa-locka only 2 1/2 miles from Opa-locka. Dade County did not choose to provide bus service feeding Opa-locka patrons to the rail system at Golden Glades because it did not want to loose express bus patrons to the rail service.

The Miami Airport station is the southern terminal of the rail service. It is located in an area where the local street network to the rail station is not conducive to bus operations due to narrow streets, with geometry difficult for buses to negotiate, numerous rail siding crossings, and poor roadway surfaces. In the future, the access roads to the station will require major improvements. The main feeder bus market

for this station is to and from the adjacent Miami International Airport and the aviation-related industries supporting and supplementing the airport.

Dade County is providing two buses per day making 38 trips covering 619 miles on two routes, while serving the one station. The average cost per day is \$600 or \$156,000 per year.

Experience to date indicates that the feeder bus service being provided by the counties is inadequate to develop the full rail ridership potential in the three counties. The existing county systems are designed to primarily serve the central business districts of the cities which mainly border the Atlantic ocean to the east of the railroad. To further complicate the bus situation the commuter rail administration, the TCRA, has no authority over the county bus organizations which monitor, control and administer the bus service contracts. Also needed is additional parking at the stations and an express bus service to and from the rail stations, meeting all train times, to auxiliary parking lots and major transfer points on the existing county bus grids or routes. This would integrate the existing bus systems with the rail stations. A large part of the success and viability of the rail system is dependent on the counties taking whatever action is necessary to get the rail patrons to and from the rail stations and their homes or places of employment.

D. System Security and Safety Plan

1. System Security

The feasibility study concept of what the commuter rail security system should have consisted of and what was actually implemented by TCRA differs considerably in make up and cost. Security aboard railroad passenger trains has traditionally been the jurisdiction of the railroad conductor. The conductor, under the railroad book of operating rules, is held responsible for the operation of the train in accordance with the book of rules and for the safety of the train and it's passengers. An assistant conductor is currently provided on each commuter train under the UTDC operations contract. The duties of the assistant conductor are to assist the conductor in carrying out his duties which can include the collection and verification of tickets indicating payment of fare.

Florida Statute 341.3025 "Multicounty public rail system fare enforcement", provides the necessary legal authority for train crew members to issue citations to passengers not having valid commuter rail tickets. Trainmen certified as enforcement of fare officers cannot bear arms nor do they have arrest authority. Any person riding the rail system without paying the proper fare is subject to a citation by an enforcement officer of the rail system and is guilty of a noncriminal violation punishable by a fine of \$50. Any person cited for a fare violation must sign and accept the citation indicating a promise to appear in a county court. Any person who does not elect to appear must pay the fine by mail or in person within 30 days of the date of the citation. Any person who elects to appear before the judge is deemed to have waived his right to pay the \$50 penalty. The judge, after a trial, makes the determination as to whether an infraction has been proven and may impose a civil penalty not to exceed \$500. The commuter rail authority may employ enforcement officers or contract with a private firm or company for their services. The assistant conductors are in the latter category.

As mentioned previously, the TCRA operating staff were not on the property until approximately three months before the start up of service. Serious efforts to provide a security force for onboard train ticket verification, for maintaining order and prohibiting vandalism on the trains, and for station and right of way safety were not begun until November, 1988. Meetings were held with the Metro Dade Police Department (Transit Section), the Broward County Sheriff's Office, and the Palm Beach County Sheriff's Office. Broward and Palm Beach Counties had sufficient resources to provide service in time for the commuter rail start up date of January 9, 1989, however, Dade County reported they were understaffed and would require one year to provide officers required. This obviously was unsatisfactory. In the interim the Florida Highway Patrol indicated interest in providing the service. Negotiations were begun in December, 1988 and an agreement was reached on January 5, 1989. The Florida Highway Patrol provided 20 full time dedicated

troopers to the commuter service and state owned rail corridor until February 16, 1989. They withdrew because assigning 20 troopers to the rail system resulted in understaffing in other areas of law enforcement and replacements required six months to hire and train.

Negotiations were resumed with Broward and Palm Beach Counties to provide service for the entire commuter rail system. While the negotiations were in progress "off duty" Florida Highway Patrol troopers were used to provide security in all three counties. An agreement was reached on May 1, 1989 with Broward and Palm Beach counties to provide service in their respective counties. "Off duty" Highway Patrol troopers continued to patrol in Dade county until July 26, 1989 when an agreement was finalized between Dade and Broward Counties. Beginning on July 27, 1989 and continuing to date Broward County deputy sheriffs cover the commuter rail system in Dade and Broward Counties and Palm Beach deputies police the system in Palm Beach County. The terms of the current security contract with Broward and Palm Beach Counties follow:

Broward County Sheriff's Department.

- A. Six deputies.
- B. Coverage in Broward and Dade Counties.
- C. Duties:
 - 1. On board protection.
 - 2. Check tickets for fare evasion.
 - 3. Patrol railroad R/W and property.
 - 4. Respond to commuter rail emergencies.
- D. Contract Price for 1 year.....\$301,509.

Palm Beach County Sheriff's Department.

- A. Three deputies.
- B. Coverage in Palm Beach County.
- C. Duties (Same as in Broward County).
- D. Contract Price for 1 year.....\$145,851.

Total Contract Price for 1989-1990.....\$447,360.

This price averages \$49,707 per officer including the patrol cars, access to the county wide sheriff's radio network, and the officer's salaries as well as employee benefits and various employment taxes.

2. System Safety Plan

Florida Statute 341.061 requires that public transportation agencies develop and implement a System Safety Plan. The TCRA accordingly drafted and had approved by the Florida Department of Transportation a plan applicable to the operation and maintenance of the commuter rail system. The plan defines the responsibilities associated with safety for all TCRA, UTDC, ATE and CSXT railroad employees as well as the responsibilities of the respective managements in assuring a safe operation. A summary of the main provisions of the plan follows:

A. Purpose

The plan establishes the accident prevention and control methods used to maximize the safety of the passengers, employees, emergency response personnel, general public and property.

B. Definition

System Safety is defined as the coordinated effort of all TCRA, UTDC, ATE, and CSXT railroad employees under the direction and guidance of the TCRA management to:

- Conserve life and property.
- Prevent accidents and injuries and reduce accidents.
- Control and minimize the effects of accidents.
- Maintain the safe operation of the commuter system.
- Reduce hazards to the lowest possible level through the most effective use of available resources.
- Provide for the occupational safety and health of all employees.

C. Scope

Defines the system safety activities for the TCRA, UTDC, ATE, and CSXT, more specifically:

- Includes all TCRA, UTDC, ATE, and CSXT offices and departments involved in the operation and maintenance of the commuter rail system and related facilities.
- Applies to all activities which involve design, construction, testing, operation and maintenance of the commuter rail system.
- Charges each manager, department and office with responsibility for the system safety plan's implementation and success.
- Requires coordination, integration, communication and cooperation among all managers, departments, and offices in matters relating to safety.
- Encompasses all fixed facilities, vehicles and employee activities and applies to all who come in contact with the transportation system.
- Includes interfaces with local, state and federal governmental bodies and citizen groups regarding safety.

D. Applicable Safety Rules

The major method used to insure industrial safety in the railroad industry is to require strict compliance with formal railroad operating and maintenance safety rules compiled primarily from railroad accident and injury experience and statistics since the railroad industry began in the United States. Therefore, the following CSXT documents were adopted by the TCRA and certified in the system safety plan as being the applicable safety rules and documents under which the commuter rail system would operate:

- a. The CSXT Transportation, Inc. Operating Rules, effective January 1, 1987, and as amended thereafter.
- b. The CSXT Transportation, Inc. Safety Handbook, for all crafts, effective September 1, 1987 and as amended thereafter.
- c. The CSXT Transportation, Inc., Tampa Division, Miami Sub-Division Timetable and Special Instructions current issue dated October 25, 1987.

- d. The current Tri-Rail Train Schedule.
- e. The TCRA Emergency Response Procedures governing:
 - 1. On-board equipment failures.
 - 2. Immobilized train.
 - 3. Derailment.
 - 4. Fire.
 - 5. Collision with other trains.
 - 6. Grade crossing accidents.

All TCRA, UTDC, and CSXT employees are governed by and must fully comply with the requirements of these documents as they apply to his or her respective duties while on the operating property of the commuter railroad.

E. Goals

The goals of the system safety plan are to achieve the following:

- The safety of the passenger, TCRA, UTDC, and CSXT personnel, equipment and property.
- The health and safety provisions for the maintenance and operating personnel will meet or exceed those required by federal, state and local regulatory authorities.
- The operation of the system will meet or exceed all relevant federal, state and local safety codes and regulations.
- At a minimum the operating system will be maintained at the safety level identified at the initiation of revenue service.

F. Objectives

The specific objectives of the system safety plan are:

- The publication and implementation of the plan.
- The timely implementation of the plan.
- The safety certification of the Tri-County Commuter Rail System and any additions or modifications thereto.

- The development of a single source for the overview, implementation, maintenance and enforcement of the system safety plan for the commuter rail system.

G. Authority

The authority and responsibility for the implementation of the plan is vested in the TCRA executive director who in turn delegates the enforcement of the system safety plan rules to the UTDC and to CSXT for compliance by their respective employees. The executive director of the TCRA certified the plan with his signature on December 9, 1988.

H. Accidents and Injuries

From January 9, 1989 to May 1, 1990 the following accidents and personal injuries have occurred:

Accidents to Passenger, Trespassers and Non-Trespassers

Type of Accident	Passengers	Trespassers	Non-Trespassers
Fall or Trip	7	0	0
Struck by Object	1	1	1
Burn	1	0	0
Grade Crossing	1	0	0
Miscellaneous	1	0	0
Total	11	1	1

Personal Injuries Incurred by UTDC Operating Employees

Type of Accident	Class of Employee	
	Transportation	Maintenance
Fall	2	4
Lifting	1	0
Vapor Inhalation	0	1
Puncture Wound	0	1
Foreign Object in Eye	0	4
Struck by Object	1	0
Burn	0	2
Total	4	12

Summary: Of these 16 accidents, 7 were FRA reportable with 3 lost time and 9 were non-FRA reportable.

Grade Crossing Accidents

Cause of Accidents				
Driver Stopped on Track		Driver Abandoned Car on Track		Driver Drove Around Gates
6		5		1
	Injuries		Fatalities	
	4		1 - Suicide	

Summary: 12 grade crossing accidents, 4 minor injuries, 1 fatality.

In the period from October, 1988, when equipment testing began until May 1, 1990 there have been a total of 17 claims for accident damages. These amounted to \$10,217 and were primarily for damages to automobiles struck by descending crossing gates. An unknown number of personal injury law suits are pending.

VI. Summary and Future Viability

A. Cost and Revenue Summary

1. Capital Costs Expended as of January 10, 1990

Item	Capital Cost
Engineering	\$3,421,807
Locomotives ¹	\$4,694,599
Coaches ¹	\$18,100,906
Wheel Chair Ramps (Portable)	\$2,394
Stations	\$16,026,857
Track, Signal & Bridge Rehabilitation	\$16,124,757
Car Washer Hialeah	\$145,467
Head End Power Receptacles	\$274,700
West Palm Layover Base	\$840,188
TOTAL	\$59,631,675

¹ Final payment for spare parts still due as of January 10, 1990. On the coaches the delivery penalty of \$269,600 will not be paid to the contractor.

2. Operating Costs

SEVEN MONTHS 1989 OPERATING COSTS IN 1000's OF DOLLARS

Expenditures	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Percent
Administration	\$115	\$81	\$86	\$83	\$116	\$141	\$158	\$770	10.7%
Ticketing (AT&T)	\$65	\$67	\$68	\$67	\$71	\$70	\$71	\$472	6.3%
Operating	\$149	\$29	\$62	\$58	\$27	\$135	\$35	\$545	8.5%
Operator (UTDC)	\$476	\$476	\$476	\$476	\$476	\$476	\$476	\$3,352	43.7%
Marketing	\$3	\$9	\$5	\$5	\$3	\$18	\$36	\$83	1.1%
Insurance	\$355	\$330	\$330	\$330	\$330	\$331	\$330	\$2,316	30.4%
TOTAL	\$1,144	\$1,002	\$1,029	\$1,049	\$1,023	\$1,173	\$1,157	\$7,627	100.0%

THREE MONTHS 1990 OPERATING COST IN 1000'S OF DOLLARS

Expenditures	Jan.	Feb.	March	Total	Percent	Ten Month	Ten Month
						Totals	Percent
Administration	\$141	\$147	\$251	\$539	15.1%	\$1,317	11.8%
Ticketing (ATE)	\$77	\$66	\$93	\$236	6.6%	\$707	6.3%
Operating	\$149	\$123	\$76	\$347	9.7%	\$993	8.9%
Operator (UTDC)	\$427	\$427	\$427	\$1,281	35.8%	\$4,613	41.2%
Marketing	\$55	\$37	\$93	\$185	5.2%	\$268	2.4%
Insurance	\$330	\$330	\$330	\$990	27.7%	\$3,306	29.5%
TOTAL	\$1,173	\$1,123	\$1,269	\$3,577	100.0%	\$11,204	100.0%

3. Revenues

REVENUE BY MONTH BY YEAR

Month	1989	1990
January	\$0	\$149,843
February	\$0	\$159,567
March	\$0	\$177,285
April	\$0	\$0
May *	\$64,238	\$0
June	\$48,903	\$0
July	\$80,026	\$0
August	\$106,620	\$0
September	\$98,421	\$0
October	\$121,102	\$0
November	\$102,829	\$0
December	\$102,365	\$0
TOTAL	\$724,504	\$486,695
Monthly Average	\$103,501	\$162,232

* Advanced sales prior to beginning of fare collection on June 1, 1989

REVENUE BY STATIONS
Seven Months of 1989

Station	Revenues	Percent	Rank
Miami Airport	\$38,689	5.34%	11
Metro Rail	\$66,715	9.21%	3
Golden Glades	\$42,328	5.84%	10
Hollywood	\$82,114	11.33%	2
Fort Lauderdale Airport	\$26,916	3.72%	13
Fort Lauderdale	\$90,199	12.45%	1
Cypress Creek	\$50,550	6.98%	7
Pompano Beach	\$52,872	7.30%	6
Deerfield Beach	\$45,980	6.35%	9
Boca Raton	\$53,900	7.44%	5
Delray Beach	\$28,436	4.06%	12
Boynton Beach *	\$1,406	0.19%	15
Lake Worth	\$49,464	6.83%	8
Palm Beach Airport	\$17,797	2.46%	14
West Palm Beach	\$57,008	7.87%	4
Mail & Telephone Sales	\$19,131	2.64%	
TOTAL	\$724,504	100.00%	

* in service one month

4. Operating Ratio

1989 June through December, $\$724,504 / \$7,627,100 = 9.50\%$

1990 January through March, $\$486,695 / \$3,577,600 = 13.60\%$

B. Future Viability

The future viability of the commuter rail system is dependent on the improvement of the operating ratio. The 1989 ratio averaged 9.50% after seven months of revenue service. After three months experience in 1990, it averaged 13.60%. Neither ratio is conducive to long term viability of the service. Based on other ongoing commuter operations in the United States a goal of 35% to 40% would be a reasonable objective to reach by the end of five years of operation.

Under current conditions, a funding source in addition to state funds must be established to fund deficits associated with the operation of the service. The service primarily benefits the residents, business interests and tourists in the three counties. The counties' financial commitment to annual operating costs to date has been the \$1.15 million, which was specified in the original finance agreement between the FDOT and the three counties, and represents 7.7% of the system's operating budget.

If the operating ratio were to optimistically double to 25% in 90/91, annual revenues would have to increase to \$3,750,000. This means revenues must increase to a monthly average of \$312,500 from the current 1990 monthly average of \$162,232 or an increase of 93%. Patronage, assuming the same type of ticket sale proportions and the same fare structure, would have to increase accordingly. If daily ridership now averages 5000 riders per day, it must increase to 9,600 to make the 25% operating ratio. Even with the recent increased levels of service and marketing effort, with gratifying corresponding increases in revenues, a doubling of ridership in 90/91 has to be viewed as highly optimistic.

Effecting a major reduction in operating costs and further increases in revenues will require a major and determined effort on the part of all involved parties.

Operating Costs could be reduced in the following areas:

1. A major reduction in operating costs would occur if the \$100,000,000 insurance requirement and current \$2,875,000 annual insurance premium were reduced. CSXT has agreed to reduce the insurance requirement to \$75,000,000. The 1990 legislature passed legislation permitting the TCRA to directly purchase insurance from "Off Shore" companies whose premium rates are less than the underwriters initially used. Another possibility to reduce the insurance premium would be to increase the self insured retention amount (now \$5,000,000) based on the low liability exposure experience of the service to date.
2. A major area of significant cost exposure is contracts with outside parties for certain services. Many of the commuter rail systems in the

United States are operated for public transportation authorities by the parent railroad companies. The railroad companies entered into agreements to continue providing an existing service required by the public at the public's expense. In other systems the transportation authorities directly employ the personnel as public employees and operate the service themselves. FDOT/TCRA did not have the first option available to them because CSXT declined to operate or maintain the commuter trains. The second alternative also was not available because the service was new and the hiring and training of an entirely new operating, maintenance and supporting staff in the time frame available, approximately six months, was not possible. Consequently, FDOT/TCRA competitively bid contracts for train operations and equipment maintenance, security, and fare collection and revenue accounting. Each of these contracts contain profit margins and various overhead rates, most of which are near or equal to 135%. Overhead is passed on to TCRA and added to the system's operating costs. In some instances these factors are duplicated through subcontracting. The TCRA should assess the impacts of profit margins and overhead costs in current service contracts, and, where cost effective, employ and train the necessary personnel to provide these services or restructure its contracts.

3. The decision to man each of the fifteen stations instead of utilizing ticket machines resulted in an unanticipated cost. Consideration should be given to reducing station manpower at certain locations by installing ticket dispensing machines. The TCRA should assess whether cost reduction opportunities exist in this area.
4. Savings also may be realized in the railroad fixed facilities and property security area. The TCRA and the FDOT should assess the viability of jointly establishing and funding a police force, similar to existing railroad police systems, for protection of both the commuter system and the state owned property used by the system.

Revenue can be improved in the following ways:

1. Revenues should be maximized by implementing as soon as possible a graduated zone fare as recommended in the feasibility study. The \$2 fixed fare is unduly beneficial to long distance riders and, potentially, detrimental to attracting shorter distance riders. The average trip length on Interstate 95 is 12 miles. It is not cost-effective to charge the majority of the system's patrons who are traveling an average of 12 miles the same fare as those traveling greater distances. Experience

has shown that the additional riders gained with a graduated zone fare exceed the long distance riders lost and, thus, revenues are increased.

2. The feeder bus and station parking lot inadequacies must be addressed. If this is not done the system will not realize its revenue potential. Improvement of the feeder bus system should be the first and most important goal of the counties and the TCRA.
3. An aggressive marketing program should be continued, making certain that the month to month ridership increases attributed to marketing are documented and used as a basis for marketing program expenditures.

C. Lessons Learned

This paper provides information outlining Florida's experience in initiating commuter rail service over a very short period of time. Many dedicated individuals, from elected officials to staff of numerous agencies in city, county, state, and federal government, as well as from commuter agencies, private corporations and other citizens of Florida, played a role in bringing the rail service to south Florida. Numerous lessons were learned and hopefully they will be of benefit to others seeking to develop commuter rail systems in other areas of Florida and the United States.

1. In a decentralized operating environment, as was the case in the FDOT during development of the project, accountability for project development should be placed at the lowest level possible. Ideally, a local entity, serving as the project sponsor, should be the lead project development agency with assistance (financial, technical, etc.) provided by the FDOT.
2. Hire the railroad company who owns and maintains the property to operate the commuter service and maintain the equipment and fixed facilities for cost plus a fixed fee.
3. If the owning railroad declines to operate the service, enter into one competitively bid cost plus fixed fee contract for all train operations, equipment maintenance, facility maintenance, ticket sales, revenue accounting, marketing, station manning and system security functions. If for whatever reason this cannot be done, keep the number of contracts to a minimum.

Another option is for the public agency setting up the commuter system to employ and train the people necessary to operate the system as public employees. This may require an additional year depending on the level of experience of the people available to be hired.

4. Under 2. and 3. above, the transportation authority staff responsible for administering contracts for operating the system should be in place and take part in negotiating the operating agreements. The locomotive and coach maintenance officer should be in place when the respective procurement contracts are negotiated and executed.
5. Locomotives and coaches which have been designed and for which specifications are largely already available should be purchased. If under production for another service, savings can be realized by adding to an existing production line. If there is a choice, do not acquire the units at the beginning of the line. The first several cars off a new line usually require corrections and modifications. Adding the order to an

12. Do not assume any labor protection obligations without careful review.
13. If a railroad is operating the service and/or the commuter service is utilizing existing railroad facilities, make every effort to include, for a fee, the commuter rail's insurance and indemnification liabilities under the railroad's insurance policies. Failing to accomplish this forces the commuter rail operating agency to seek insurance in the market place at high premiums. Another insurance dilemma is whether or not to include the service contractors under the system's liability and indemnification policies. If this is not done and the contractors provide their own insurance the costs are passed on to the commuter agency.
14. Station sites and designs should be fixed and completed as early as possible in the project planning and construction phases, respectively.
15. Do not make the mistake of basing the number of parking lot spaces on the amount of available land at the station site. Estimate the spaces required from total estimated patronage passing through the station and provide funds to acquire the property, by condemnation if necessary. This takes time and therefore should be started early in the process.
16. If the commuter service uses the fixed facilities of an existing railroad, the railroad will attempt to dictate new fixed facilities and modifications to existing facilities as well as the level of maintenance to be provided. In addition, the railroad will want to maximize the use of its own forces under the terms of existing labor contracts. It is essential that the entity responsible for developing a commuter rail system utilize whatever time and resources are necessary to adequately prepare for tough negotiations with the railroad.
17. The agency operating the commuter service should have access to a single, full-time lawyer from the time the agency is formed and not be dependent on multiple attorneys employed by municipalities or counties served by the commuter rail system.

already in production order can also produce savings in the cost of spare parts. A full time agency inspector should be present at the plant during the time of production.

Another advantage of purchasing an in production car or locomotive of the same type as those in use by other commuter systems is the possibility of entering into a buy back arrangement with the manufacturer or resale to another commuter authority who uses that type.

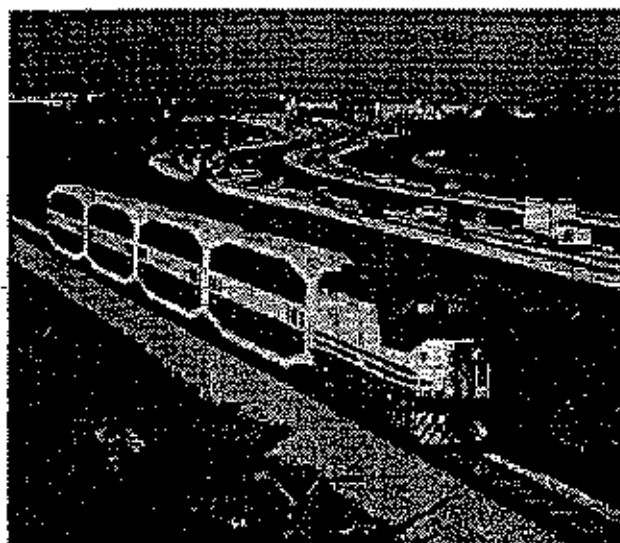
6. Bi-level or gallery cars, if overhead clearances permit, save station platform construction costs by approximately doubling capacity per given train length. A wheel and truck maintenance savings is also realized with fewer running gear components to maintain.
7. The low floor level of the UTDC bi-level cars permitted boarding the handicapped directly into the lower level of the cars using a portable ramp and platform overlay on existing at grade platforms. This saved the expense of constructing bi-level platforms or providing elevator lifts in conventional floor cars operating from low level at-grade platforms. Importantly, involve affected handicapped groups when accessibility issues are under consideration.
8. Extra locomotives and cars should be purchased as funding permits. Do not underestimate the need for spare equipment.
9. The service should be monitored periodically to determine the optimum number of cars in the train sets. More cars than necessary should not be used. Using more cars than necessary adds wear and tear to the running gear, air conditioning and other car systems and increases maintenance costs. Train sizes should be adjusted for ridership levels.
10. In any matter regarding access to the system by the handicapped and elderly be certain to involve the local handicapped and elderly organizations early. Meeting all minimum code requirements does not necessarily make a system conveniently accessible.
11. Operational contracts should be cost plus a fixed fee. The operations contract with the railroad or private contractor should be very carefully reviewed and analyzed to make certain that the contract specifies the levels of service, what manpower is to be provided, and the contract obligations and responsibilities of each party.

TRI RAIL™

Introduction

The Tri-County Commuter Rail Authority (Tri-Rail) is responsible for the operation of commuter rail service along the 71.7-mile South Florida Rail Corridor. The rail corridor extends northward from the Miami Airport Station in Miami-Dade County through Broward County to the northern terminus at the Mangonia Park Station in Palm Beach County.

This rail corridor is currently operating at capacity, with not only Tri-Rail commuter traffic, but also daily CSXT freight trains and Amtrak passenger trains. To address this problem, Tri-Rail has undertaken an aggressive program of projects to improve the corridor system as a whole. The Program, known as the *Double Track Corridor Improvement Program (Segment 5 Project)*, entails the laying of a second mainline track along the current 71.7 miles of rail right-of-way, upgrading the grade crossing and signal systems and modifying stations to accommodate the double track.



The Segment 5 Project, which is approximately 44.31-miles long, is the portion of the Program covered by the Full Funding Grant Agreement (FFGA). Construction of the Segment 5 Project is scheduled to begin later this year with completion anticipated for March 31, 2005.

The Segment 5 Project, once completed in March 2005, will facilitate the following transportation improvements:

- Improve on-time performance by reducing rail congestion and scheduling conflicts with Amtrak, CSXT, and Tri-Rail – the three users of the South Florida Rail Corridor;
- Increase the effectiveness of public transit to meet travel demands of existing and future transit users;
- Improve safety and efficiency of commuter, freight and passenger train operations on the South Florida Rail Corridor; and
- Improve peak period passenger service through the provisions of 20-minute headways.

Segment 5 Project Funding

- | | |
|---------------------------------|---------------|
| • Federal Discretionary Funds | \$110m |
| • State Matching Funds | \$ 55m |
| • Private Matching Funds | \$ 55m |
| • Local: Federal Flex & Formula | \$ 58m |
| • Other State Funds | <u>\$ 49m</u> |

Total \$327m

For more information, Contact Dennis Newjahr,
Tri-Rail's Director of Planning & Capital
Development at (954) 788-7896.

EXHIBIT T

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GROSSE POINTE NEWS 2001
Phil Hands

Address comments to cartoonist Phil Hands at HANSPO@kenyon.edu

Letters

she adds to
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Thanks City voters

To the Editor:

Thanks to all the City of
Grosse Pointe voters who
braved the beautiful warm

The 25 percent turnout
was terrific and the 4-to-1 in
favor of the bond was awe-
some. I am so happy and
proud to be a resident in this
marvelous city where my
neighbors and friends have

the Grosse Pointe News as a
candidate for trustee in the
upcoming Grosse Pointe
Shores election ("Five candi-
dates seek three spots on
Shores board," May 3). I
would like to clarify a state-

EXHIBIT U



PARTNERSHIP * FOR * A * WALKABLE * AMERICA

Walkable America Checklist

Also see: [Improving Your Community's Score](#)

How Walkable Is Your Community?

**Take a walk with a child and
decide for yourselves.**

Everyone benefits from walking. But walking needs to be safe and easy. Print out this checklist, take a walk with your child, and use it to decide if your neighborhood is a friendly place to walk. Take heart if you find problems; there are ways you can make things better.

Getting started

Pick a place to walk, like the route to school, a friend's house or just somewhere fun to go. Read over the checklist before you go, and as you walk note the locations of things you would like to change. At the end of your walk, give an overall rating to each question. Then add up the numbers to see how you rated your walk.

Rating scale

- 1 = awful
- 2 = quite a few problems
- 3 = some problems
- 4 = good
- 5 = very good
- 6 = excellent

Location of Your Walk:

From To

1. Did you have room to walk?

- ☐ Yes | ☐ Some problems (see below)
- ☐ Sidewalks started and stopped
- ☐ Sidewalks were broken or cracked
- ☐ Sidewalks were blocked with poles, signs, shrubbery, dumpsters, etc.
- ☐ No sidewalks, paths, or shoulders
- ☐ Too much traffic? ☐ Something else?

Rating: 1 2 3 4 5 6 Locations of problems: **2. Was it easy to cross streets?**

- ☐ Yes | ☐ Some problems (see below)
- ☐ Road was too wide
- ☐ Traffic signals made us wait too long or did not give us enough time to cross
- ☐ Needed striped crosswalks or traffic signals
- ☐ Parked cars blocked our view of traffic
- ☐ Trees or plants blocked our view of traffic
- ☐ Needed curb ramps or ramps needed repair
- ☐ Something else?

Rating: 1 2 3 4 5 6 Locations of problems: **3. Did drivers behave well?**

- ☐ Good | ☐ Some problems. Drivers ... (see below)
- ☐ Backed out of driveways without looking

- ☐ Did not yield to people crossing the street
- ☐ Turned into people crossing the street
- ☐ Sped up to make it through traffic lights or drove through red lights
- ☐ Something else?

Rating: 1 2 3 4 5 6 Locations of problems: **4. Was it easy to follow safety rules?****Could you and your child ...**Cross at crosswalks or where you could see and be seen by drivers? ☐ Yes ☐ NoStop and look left, right and then left again before crossing streets? ☐ Yes ☐ NoWalk on sidewalks or shoulders facing traffic where there were no sidewalks? ☐ Yes ☐ NoCross with the light? ☐ Yes ☐ NoRating: 1 2 3 4 5 6 Locations of problems: **5. Was your walk pleasant?**

- ☐ Nice | ☐ Some unpleasant things (see below)
- ☐ Needed more grass, flowers or trees
- ☐ Scary dogs
- ☐ Scary people
- ☐ Not well lighted
- ☐ Dirty, lots of litter or trash
- ☐ Something else?

Rating: 1 2 3 4 5 6 Locations of problems: **How does your neighborhood stack up?****Add up your ratings and decide**

1. _____
2. _____
3. _____
4. _____
5. _____

Scoring**26-30:** Celebrate! You have a great neighborhood for walking.**21-25:** Celebrate a little. Your neighborhood is pretty good.**16-20:** Okay, but it needs work.**11-15:** It needs lots of work. You deserve better than that._____**TOTAL** **5-10:** Call out the National Guard before you walk. It's a disaster area.

Found something that needs changing? Continue through the checklist below to learn how you can begin making neighborhoods better places for walking that match up with the problems you identified.

During your walk, how did you feel physically? Walking is a great form of exercise. But if you could not go as far as fast as you wanted because you were short of breath, tired or had sore feet or muscles, there are

suggestions for dealing with that, too.

Improving Your Community's Score

	What you and your child can do IMMEDIATELY	What you and your community can do with more time:
1. Did you have room to walk? ...Sidewalks or paths started and stopped ...Sidewalks broken or cracked ...Sidewalks blocked ...No sidewalks, paths or shoulders ...Too much traffic	...pick another route for now ...tell local traffic engineering or public works department about specific problems and provide a copy of the checklist	...speak up at board/development meetings ...write or petition city for walkways ...gather neighborhood signatures ...make media aware of problem
2. Was it easy to cross streets? ...Road too wide ...Traffic signals made us wait too long or did not give us enough time to cross ...Crosswalks/traffic signals needed ...View of traffic blocked by parked cars, trees, or plants ...Needed curb ramps or ramps needed repair	...pick another route for now ...share problems and checklist with local traffic engineering or public works department ...trim your trees or bushes that block the street and ask your neighbors to do the same ...leave nice notes on problem cars asking owners not to park there	...push for crosswalks/signals/parking changes/curb ramps at city meetings ...report to traffic engineer where parked cars are safety hazards ...report illegally parked cars to the police ...request that the public works department trim trees or plants ...make media aware of problem
3. Did drivers behave well? ...Backed without looking ...Did not yield ...Turned into walkers ...Drove too fast ...Sped up to make traffic lights or drove through red lights	...pick another route for now ...set an example: slow down and be considerate of others ...encourage your neighbors to do the same ...report unsafe driving to police	...petition for more enforcement ...ask city planners and traffic engineers for traffic calming ideas ...request protected turns ...ask schools about getting crossing guards at key locations ...organize a neighborhood speed watch program
4. Could you follow safety rules? ...Cross at crosswalks or where you could see and be seen ...Stop and look left, right, left before crossing ...Walk on sidewalks or shoulders facing traffic ...Cross with the light	...educate yourself and your child about safe walking ...organize parents in your neighborhood to walk children to school	...encourage schools to teach walking safety ...help schools start safe walking programs ...encourage corporate support for flex schedules so parents can walk children to school
5. Was your walk pleasant? ...Needs grass, flowers, trees ...Scary dogs ...Scary people ...Not well lit ...Dirty, litter	...point out areas to avoid to your child; agree on safe routes ...ask neighbors to keep dogs leashed or fenced ...report scary dogs to the animal control department ...report scary people to the police ...take a walk with a trash bag ...plant trees, flowers and bushes in your yard	...request increased police enforcement ...start a crime watch program in your neighborhood ...organize a community clean-up day ...sponsor a neighborhood beautification or tree-planting day

A quick health check. ...Could not go as far or as fast as we wanted ...Were tired, short of breath or had sore feet or muscles	...start with short walks and work up to 30 minutes of walking most days ...invite a friend or child along ...replace some driving trips with walking trips	...get media to do a story about the health benefits of walking ...call parks and recreation department about community walks ...encourage corporate support for employee walking programs
--	---	--

Menu

June 3, 1999

EXHIBIT V

MEAN STREETS

2000



Pedestrian Safety,
Health and
Federal Transportation Spending

A TRANSPORTATION AND QUALITY OF LIFE CAMPAIGN REPORT
SURFACE TRANSPORTATION POLICY PROJECT

Acknowledgements

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To Order Additional Copies:

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This report, as well as state-by-state fact sheets based on this report, are available online at <http://www.transact.org>

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Executive Summary

Walking in the United States is a dangerous business. Per mile traveled, pedestrians are 36 times more likely to die in a collision than drivers. In this report STPP examines the pedestrian safety problem through analysis of federal safety, health, and spending statistics. This report identifies the cities where pedestrians are most at risk, finding that sprawling communities that fail to create safe places to walk are the most dangerous. It documents how the dangers of walking in automobile-dominated areas is driving pedestrians off the street. People are taking far fewer trips by foot, because walking has become unsafe and inconvenient in so many places. This means a growing number of people are facing another type of danger: the health conditions and diseases associated with a sedentary lifestyle. This report also shows that only minimal federal transportation resources have been devoted to making walking safe and convenient. The final chapter outlines solutions that can make walking not only safe, but attractive and convenient.

Sprawling communities that fail to create safe places to walk are the most dangerous for pedestrians.

The Most Dangerous Places for Pedestrians

Data collected by the federal government shows that in 1997 and 1998, thirteen percent of all traffic fatalities were pedestrians: a toll of 10,696 people. But the risk of dying as a pedestrian varies depending upon where you live. STPP analyzed both the amount of walking in a community and the number of pedestrian deaths in the years 1997 and 1998 (the most recent years for which localized data are available) to compare the risks faced by the average walker in different areas. According to this Pedestrian Danger Index, the most dangerous metro area for walking is Tampa, Florida, followed by Atlanta, Miami, Orlando, Jacksonville, Phoenix, West Palm Beach, Memphis, Dallas, and New Orleans. These results show that the most dangerous places for walking tend to be the newer Southern and Western metro areas.

These are places where sprawling development has often left pedestrians stranded. Wide roads have been built without sidewalks or frequent crosswalks, and high-

Ten Most Dangerous Large Metro Areas

Rank	Metro Area	Total Pedestrian Deaths (1997-1998)	Percentage of Commuters Walking to Work	1997-1998 Pedestrian Danger Index
1	Tampa-St. Petersburg-Clearwater, FL	192	2.27%	91
2	Atlanta, GA	185	1.45%	83
3	Miami-Fort Lauderdale, FL	274	2.25%	81
4	Orlando, FL	139	3.46%	65
5	Jacksonville, FL	71	2.57%	64
6	Phoenix, AZ	190	2.65%	60
7	West Palm Beach-Boca Raton, FL	49	1.99%	58
8	Memphis, TN-AR-MS	70	2.96%	52
9	Dallas-Fort Worth, TX	192	1.86%	52
10	New Orleans, LA	88	3.09%	52

speed traffic makes these roadways particularly deadly. In many areas, intersections with crosswalks may be as much as a half-mile apart, leaving pedestrians with no safe way to cross the street. Of the pedestrian deaths for which information is recorded, almost 60 percent (59.1%) occurred in places where no crosswalk was available.

As with automobile fatalities, the total number of pedestrian deaths has dropped slightly over the last few years. However, while the amount of driving is increasing, the amount of walking is decreasing. This may mean that driving is getting safer per mile while walking is not.

Some groups of people appear to be at particular risk as pedestrians, including children, the elderly, and Latinos. Senior citizens and Latinos have high death rates compared to other populations; Latinos tend to walk more than other groups even though they often live and go to school in areas where walking is difficult and dangerous. Children also rely more heavily on walking to go places. The states with the highest death rates for children in 1997-1998 were South Carolina, Mississippi, Utah, North Carolina, Alabama, Arizona, Florida, Alaska, and Louisiana.

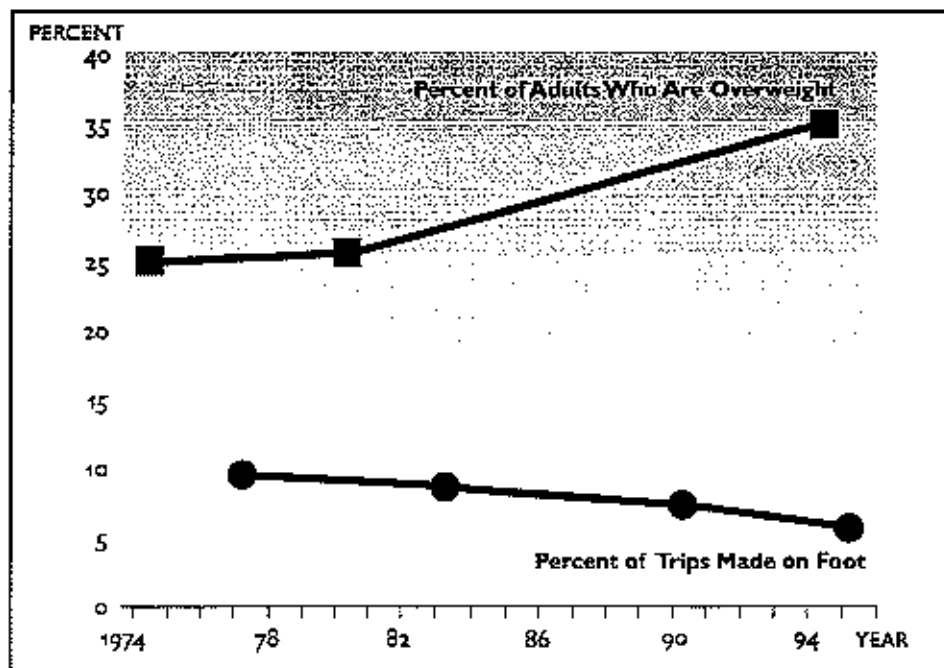
Walking Less: A Threat to Health

Poor conditions for walking are contributing to a steep drop in how much Americans walk. According to the Nationwide Personal Transportation Survey, the number of trips taken on foot dropped by 42 percent in the last 20 years. Among children, walking trips dropped by 37 percent in the same timeframe, and now almost 70 percent of children's trips take place in the back seat of a car. And walking is not getting any easier. Studies in Seattle and South Carolina both show that the newer a school or housing development, the less likely that students or residents will go

anywhere on foot. Many other studies have established that community design can make a big difference in whether people choose to walk.

The decline in walking contributes to a different type of mortality: death from diseases associated with physical inactivity. The Centers for Disease Control and Prevention estimates that 300,000 Americans die each year from such conditions, including coronary heart disease, high blood pressure, and colon cancer. The decrease in walking, the most

The Percentage of Overweight Adults has Grown as Walking has Declined



basic form of exercise, has recently been recognized as one contributing factor in the epidemic of obesity in the United States. Health officials are calling for a return to more walkable communities to improve American health by integrating walking into everyday life.

A comparison of transportation and health statistics reflects this trend. As walking has declined, the percentage of overweight adults and children has increased. In addition, metropolitan areas where people walk less tend to be places where a higher percentage of people are overweight.

The Neglect of Pedestrian Safety

Despite the clear safety and public health problems outlined above, pedestrian convenience and safety are generally neglected by state and regional transportation officials. While Americans take less than six percent of their trips on foot, thirteen percent of all traffic deaths are pedestrians. Yet the states use less than one percent (0.6 percent) of all federal transportation dollars to provide pedestrians with better facilities. Engineers traditionally design roads from the 'centerline out,' focusing almost exclusively on providing travel lanes for automobiles. Sidewalks are at best an afterthought, often considered "amenities" that can be left out. On average, the states spent just 55 cents per person of their federal dollars on pedestrian projects, compared to 72 dollars per person on highway projects. In some states, the disparity was even greater. A table with figures for each state can be found in Chapter 3.

In addition, pedestrian safety is neglected by law enforcement and safety officials who put full responsibility for avoiding a collision on the pedestrian, ignoring driver behavior. A study of police reports in New York City found that drivers were at fault in 74 percent of cases studied, yet only 16 percent of them were cited. In addition, many safety programs focus almost exclusively on keeping pedestrians out of the way of cars, rather than providing safe facilities for walking or promoting responsible behavior by drivers.

The Path to Safer Streets

The path to safer streets is clear. Communities need to invest their transportation dollars in pedestrian safety, retrofit streets to make walking safer, and design new streets and neighborhoods to encourage walking. Transportation officials should:

Spend on pedestrian safety in proportion to pedestrian deaths.

If thirteen percent of all traffic fatalities are pedestrians, it stands to reason that a similar amount of safety funds should be devoted to pedestrian safety. In addition, federal transportation dollars no longer restricted to highway use should be directed toward providing a variety of safe and convenient pedestrian facilities.

Retrofit streets with traffic calming.

With so many streets designed only for automobiles, it will take more than a few sidewalks and crosswalks to make them safe and inviting for pedestrians. Traffic calming techniques, such as curb bulb-outs and traffic circles, slow down automobiles in key places and reclaim streets for children, residents, and others on foot or bicycle.

On average, the states spent just 55 cents per person of their federal dollars on pedestrian projects.

Design new streets and neighborhoods for walking.

More people will walk in neighborhoods where there is somewhere to walk to. The best neighborhoods for walking put residents within a reasonable distance of shops, offices, schools, and transit stops, and provide a street and path network that allows direct routes between them.

Collect more information on pedestrian safety.

Federal databases provide little information about the risks associated with walking, the effectiveness of pedestrian safety measures, or even how much is spent on pedestrian safety. The National Transportation Safety Board (NTSB) and the US Bureau of Transportation Statistics should design research programs to learn more about how to improve pedestrian safety. On the local level, citizens are already performing "walkability audits" that assess the dangers to pedestrians, block by block.

Chapter One

AMERICA'S DANGEROUS STREETS

Each year, thousands of Americans are killed and tens of thousands are injured walking down the street. In 1997 and 1998, 10,696 pedestrians in the U.S. were killed in traffic accidents (5,406 in 1997 and 5,291 in 1998). More than 1,500 of these victims were children under the age of eighteen.

In comparison with other ways of getting around, walking is particularly risky. While Americans took less than six percent of their trips on foot, almost thirteen percent of all traffic deaths were pedestrians. And walking is far more dangerous than driving or flying, per mile traveled. The fatality rate per 100 million miles traveled was 1.4 deaths among automobile users, and 0.16 deaths among people aboard airplanes. But almost 50 pedestrians died for every 100 million miles walked in 1997¹. This means that for each mile traveled, walking is 36 times more dangerous than driving, and over 300 times more dangerous than flying.

About thirteen percent of all the people who died in traffic accidents during 1997-1998 were pedestrians. But this only begins to describe the scope of the problem. Pedestrians also pay a heavy toll in injuries. Data from the National Highway Traffic Safety Administration (NHTSA) reveal that in 1997 and 1998, for every pedestrian killed by a car, approximately fourteen more were injured. Government estimates show that in 1998 alone, 69,000 pedestrians were hit by cars and injured. However, this number may be low because of under-reporting.

The Most Dangerous Metro Areas for Pedestrians

Some places in the United States are more deadly for pedestrians than others. To measure that danger, we ranked the country's largest metro areas, taking into account both the rate of pedestrian deaths as measured by the National Highway Traffic Safety Administration, and the amount of pedestrian activity in the community as measured by the U.S. Census Bureau. For this study we used the average number of deaths during 1997 and 1998 (the years for which most recent localized data are available) to even out unusually safe or deadly years and present an accurate picture.

By dividing the number of fatalities in a given metro area by a measure of how much walking is occurring in that area, we arrive at a "Pedestrian Danger Index," which allows us to compare the risk faced by the average walker in different metro areas.² The resulting ranking shows that among large metro areas in



Photo by Dan Burden.

Fatality Rate per 100 Million Miles Traveled:

<i>Driving:</i>	<i>1.4</i>
<i>Flying:</i>	<i>0.2</i>
<i>Walking:</i>	<i>49.9</i>

Table 1. The Most Dangerous Large Metro Areas for Pedestrians

Rank	Metro Area	Total Pedestrian Deaths (1997-1998)	Percentage of Commuters Walking to Work	1997-1998 Pedestrian Danger Index	1995-1996 Ranking
1	Tampa-St. Petersburg-Clearwater, FL	182	2.27%	81	1
2	Atlanta, GA	185	1.45%	83	4
3	Miami-Fort Lauderdale, FL	274	2.25%	84	2
4	Orlando, FL	139	3.48%	86	7
5	Jacksonville, FL	71	2.57%	84	11
6	Phoenix, AZ	190	2.65%	80	5
7	West Palm Beach-Boca Raton, FL	49	1.99%	88	3
8	Memphis, TN-AR-MS	70	2.98%	82	15
9	Dallas-Fort Worth, TX	192	1.86%	82	8
10	New Orleans, LA	89	3.08%	82	12
11	Houston-Galveston-Brazoria, TX	205	2.28%	80	9
12	Salt Lake City-Ogden, UT	80	2.32%	89	17
13	Charlotte-Gastonia-Rock Hill, NC-SC	58	2.07%	89	18
14	Greensboro-Winston-Salem, NC	51	2.29%	86	13
15	Nashville, TN	42	1.94%	85	14
16	Las Vegas, NV	86	3.87%	84	6
17	St. Louis, MO-IL	88	2.15%	83	25
18	Oklahoma City, OK	36	2.11%	80	10
19	Los Angeles-Riverside-Orange County, CA	737	2.84%	89	16
20	Kansas City, MO-KS	52	1.88%	84	19
21	Detroit-Ann Arbor-Flint, MI	208	2.41%	86	20
22	Sacramento-Yuba, CA	71	2.68%	88	21
23	Raleigh-Durham-Chapel Hill, NC	52	3.12%	88	28
24	San Antonio, TX	81	3.58%	86	26
25	Austin-San Marcos, TX	46	2.86%	86	23
26	Denver-Boulder-Greeley, CO	94	3.28%	85	29
27	Portland-Salem, OR-WA	79	3.27%	87	24
28	San Francisco-Oakland-San Jose, CA	268	3.63%	86	31
29	San Diego, CA	134	4.53%	86	35
30	Indianapolis, IN	35	2.17%	85	22
31	Washington-Baltimore, DC-MD-VA-WV	279	3.87%	87	30
32	Grand Rapids-Muskegon-Holland, MI	28	2.76%	84	27
33	Chicago-Gary-Kenosha, IL-IN-WI	333	4.01%	82	33
34	Hartford, CT	34	3.40%	82	34
35	Seattle-Tacoma-Bremerton, WA	104	3.53%	84	36
36	Norfolk-Virginia Beach-Newport News, VA	48	3.87%	80	37
37	Cincinnati-Hamilton, OH-KY-IN	47	2.99%	89	45
38	Minneapolis-St. Paul, MN-WI	70	3.22%	89	40
39	Columbus, OH	34	3.25%	87	42
40	New York-No. New Jersey-Long Island, NY-NJ-CT-PA	869	8.31%	87	41
41	Cleveland-Akron, OH	58	2.98%	86	43
42	Buffalo-Niagara Falls, NY	32	4.38%	85	32
43	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD	197	5.28%	85	38
44	Milwaukee-Racine, WI	38	3.95%	84	39
45	Rochester, NY	24	4.34%	82	44
46	Boston, MA-NH	147	5.12%	82	47
47	Pittsburgh, PA	52	5.06%	80	46

1997 and 1998, Tampa was the most dangerous for pedestrians, followed by Atlanta, Miami, Orlando, Jacksonville, Phoenix, West Palm Beach, Memphis, Dallas, and New Orleans. (See Table 1, page 10.)

Sprawl Makes Walking More Dangerous

These results show that walking tends to be most dangerous in newer Southern and Western metro areas. Most of these places have been built-up since the 1950s and are dominated by subdivisions, office parks, and high-speed roads that are designed for fast automobile travel. This means that pedestrians may be forced to walk alongside high-speed roads without any sidewalks, and often must contend with crossing wide, busy streets with no median and few safe crossing-points. Intersections are often designed with wide, sweeping curves that allow cars to keep moving at high speed, but increase the crossing distance and danger for pedestrians. Zoning codes typically require businesses to be fronted by a large parking lot, forcing pedestrians to thread their way through a maze of parked cars to reach their destination.

In such sprawling environments, the combination of wide roads without pedestrian facilities and high-speed traffic can prove deadly. The national data show that walking is most dangerous in places without a basic network of pedestrian facilities – in other words, sidewalks and crosswalks. In many areas developed for automobiles, intersections with crosswalks may be as much as a half-mile apart, leaving pedestrians little choice but to cross these wide streets unprotected. Of the deaths for which location information was recorded, 59 percent occurred in places where pedestrians had no access to a crosswalk. While jaywalking is often given as a cause of pedestrian accidents, less than 20 percent of these fatalities occurred where a pedestrian was crossing outside of an available crosswalk.

Speed is also a major factor in whether a pedestrian accident proves to be fatal. A ten-mile per hour increase in speed, from 20 mph to 30 mph, increases the risk of death for a pedestrian in a collision nine-fold. If a car going 20 mph hits a person, there is a 95 percent chance that the person will survive. If that same car is traveling 30 mph, the person has slightly better than a 50/50 chance of survival. At 40 mph, the picture is bleaker still – only fifteen percent of people struck at this speed can be expected to survive.³

Unfortunately, for many years traffic engineers failed to address these problems. Although painted crosswalks and walk signals can help, they do little to improve pedestrian safety when placed in a haphazard fashion or spaced too far apart. One respected safety expert has described the kind of ad-hoc placement of pedestrian facilities as being like “trying to mend a severely broken leg using

Figure 1. Where Pedestrians Are Killed

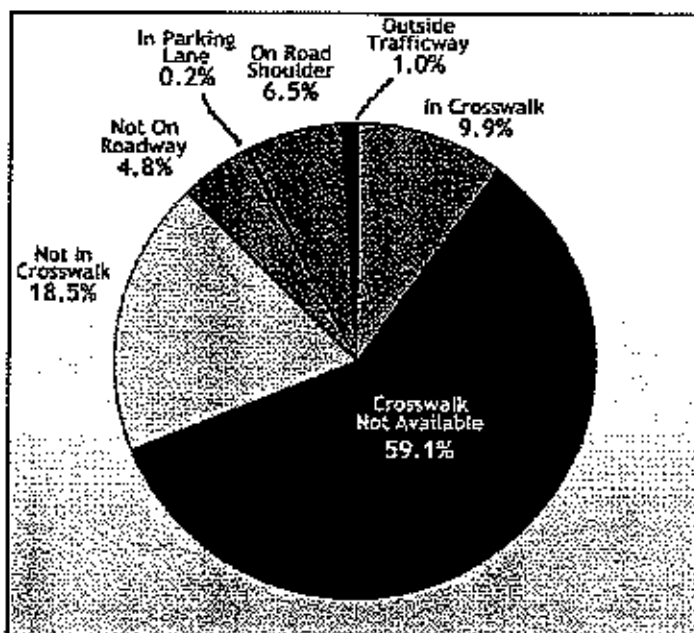


Table 2. Child Pedestrian Death Rates

State	1997-1998 Child Pedestrian Deaths	Percentage of All Pedestrian Fatalities Under 18 Years of Age	Average Annual Pedestrian Fatality Rate (per 100,000 children)
South Carolina	37	17%	1.91
Mississippi	28	23%	1.71
Utah	24	29%	1.70
North Carolina	61	18%	1.83
Alabama	32	19%	1.46
Arizona	35	11%	1.46
Florida	101	9%	1.43
Alaska	5	28%	1.34
Louisiana	33	13%	1.33
Kentucky	25	20%	1.28
Arkansas	17	18%	1.28
Tennessee	34	18%	1.28
Michigan	85	19%	1.26
Georgia	47	13%	1.17
Maryland	30	14%	1.18
Texas	127	14%	1.14
Missouri	32	16%	1.13
Wyoming	3	23%	1.13
Delaware	4	14%	1.11
New Mexico	11	9%	1.08
West Virginia	9	18%	1.08
California	191	13%	1.06
Minnesota	26	23%	1.03
Indiana	31	22%	1.02
Pennsylvania	59	17%	1.02
Vermont	3	13%	1.02
Illinois	89	16%	0.98
Ohio	56	21%	0.98
New Jersey	38	13%	0.95
Connecticut	15	15%	0.94
Nevada	8	8%	0.91
Oregon	15	12%	0.91
Oklahoma	16	14%	0.90
New York	76	10%	0.86
Idaho	6	23%	0.84
Iowa	11	21%	0.76
South Dakota	3	23%	0.74
Kansas	10	16%	0.71
Nebraska	6	15%	0.67
New Hampshire	4	18%	0.67
Washington	19	13%	0.65
Hawaii	4	8%	0.65
Rhode Island	3	17%	0.84
Colorado	13	10%	0.63
Massachusetts	17	10%	0.60
Wisconsin	16	13%	0.58
Virginia	18	9%	0.54
Montana	2	9%	0.43
North Dakota	1	11%	0.30
Maine	1	3%	0.17
Nationwide	1496	14%	1.07
Total Deaths 1997	803		
Total Deaths 1998	693		

only a small bandage."⁴⁴ In many cases this is a byproduct of the attitudes toward traffic safety in the minds of many traffic engineers. They see their top priority as making roads safer to drive at higher and higher speeds, with little consideration of the effect this might have on those not driving — pedestrians, bicyclists, neighbors, children and others. In pursuit of these goals, lanes are widened, curves are straightened, and traffic signals are re-timed, all to accommodate the journey by car. Unfortunately, each of these actions makes the roadway less safe for pedestrians.

Who Is at Risk?

Children deserve particular attention when considering pedestrian safety, because they rely more heavily than adults on walking to get where they need to go. In 1997 - 1998, sixteen percent of pedestrian deaths were people under 18 years old. Challenging street crossings that involve high speeds and many lanes of traffic can be particularly hard for young children.

For children, the states with the highest death rate⁵ were South Carolina, Mississippi, Utah, North Carolina, Alabama, Arizona, Florida, Alaska, and Louisiana. Most of these states are in the South and West, where automobile-centered development has been the strongest.

In addition, elderly people face a higher risk of death as pedestrians. Twenty-two percent of all pedestrians killed were over 65, even though only 13 percent of the population is elderly. Many pedestrian facilities, particularly walk signals, are timed for use by young adults in good health, and don't give elderly people enough time to cross in safety.

Some ethnic groups may also be at higher risk. While national statistics are not

available, several local studies point to a problem. An STPP study of California pedestrian safety found that a high proportion of pedestrian deaths and injuries in those under 20 years old were young Latinos or African Americans. In 1996, Latino children represented 38.5 percent of the total population of children in California, but they were involved in 47.9 percent of all child pedestrian incidents (fatalities and injuries). In 1996, African American children comprised 7.8 percent of the total population of children in California, but were involved in 14.2 percent of all child-related pedestrian incidents.⁶ The Latino Issues Forum attributed the discrepancy to the higher level of walking among Latinos, even though they often live and go to school in areas where walking is difficult and dangerous.⁷ The Centers for Disease Control reported recently that in Atlanta, Latinos had pedestrian fatality rates six times that of whites.⁸ Latino groups in Atlanta are pushing for better pedestrian facilities along a major seven-lane road where many pedestrians have died.⁹ A survey in suburban Washington, DC also found that Latinos were disproportionately represented in pedestrian deaths.¹⁰

Dangerous Trends for Pedestrians

The deadly environment for pedestrians in the United States is not just an inevitable consequence of modern life. Pedestrian fatality rates in the United States are far higher than in other industrialized countries. A recent study compared pedestrian fatalities in terms of the total distance walked. In both Germany and the Netherlands the rate was 26 deaths per billion kilometers walked, while in the United States the rate was 364 deaths per billion kilometers walked — or fourteen times greater.¹¹ This indicates that much more can be done to make walking safer.

Metro Areas with the Highest Proportion of Pedestrian Deaths

In some communities, pedestrian deaths represent a high portion of all traffic deaths and so deserve proportional public safety attention. Below are listed the large metro areas where 20 percent or more of traffic fatalities are pedestrians.

Rank	Metro Area	Number of Ped Fatalities (1997)	Number of Ped Fatalities (1998)	Percent of Traffic Deaths that Were Pedestrians
1	New York-New Jersey-Long Island, NY-NJ-CT-PA	447	422	29%
2	San Diego, CA	62	72	28%
3	San Francisco-Oakland-San Jose, CA	137	131	27%
4	Miami-Fort Lauderdale, FL	136	138	27%
5	Los Angeles-Riverside-Orange County, CA	401	336	25%
6	Salt Lake City-Ogden, UT	30	30	25%
7	Orlando, FL	62	77	25%
8	Tampa-St. Petersburg-Clearwater, FL	106	86	24%
9	San Antonio, TX	39	42	22%
10	New Orleans, LA	47	41	21%
11	Jacksonville, FL	28	43	21%
12	Chicago-Gary-Kenosha, IL-IN-WI	176	157	20%
13	Phoenix, AZ	95	95	20%
	Nationwide	5,406	5,293	13%

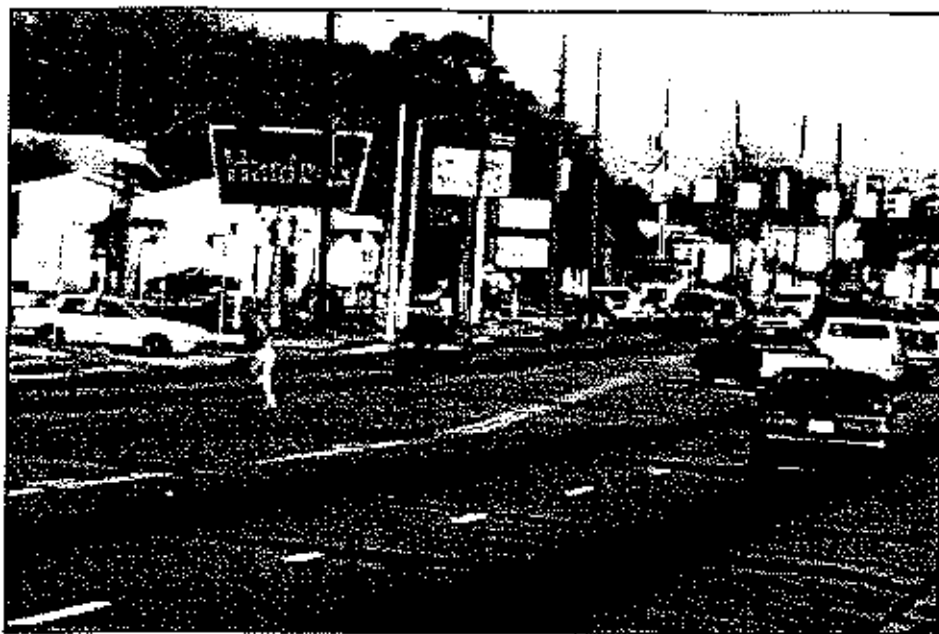


Photo provided by South Carolina Coastal Conservation League (SCCCL).

*It looks as if
driving is getting
safer per mile
while walking is
not.*

sprawling and pedestrian unfriendly nature of much new development, and the disproportionately low expenditure of federal transportation funds on projects that lessen the risks to pedestrians. These topics will be explored in greater detail in Chapter Three. And as the next chapter demonstrates, the trend toward less walking has effects on human health that reach beyond death and injury rates.

The absolute number of pedestrian deaths has dropped slightly, part of an overall decline in traffic deaths. However, the decline in deaths among pedestrians tells a different story than the decline in deaths among motorists. For motorists, deaths are falling as driving increases, while for pedestrians, deaths are falling as walking decreases. In other words, it looks as if driving is getting safer per mile while walking is not.

There are several possible explanations for this, including the increasingly

Chapter Two

THE DANGERS OF WALKING LESS

Chapter One documents the dangers faced by those who choose walking as a form of transportation. But while roads are not as safe for walking as they should be, walking less is not the answer. In fact, the sedentary lifestyle that has become the habit of so many Americans is proving to be dangerous to health. In this chapter, we explore how the decrease in walking may be increasing health risks for millions of Americans. We explore the danger faced by those who do not walk, often because they have been literally driven off the road by our car-oriented transportation system. The health care community has recognized the problem and is calling for an effort to design communities that invite walking and promote better physical health.

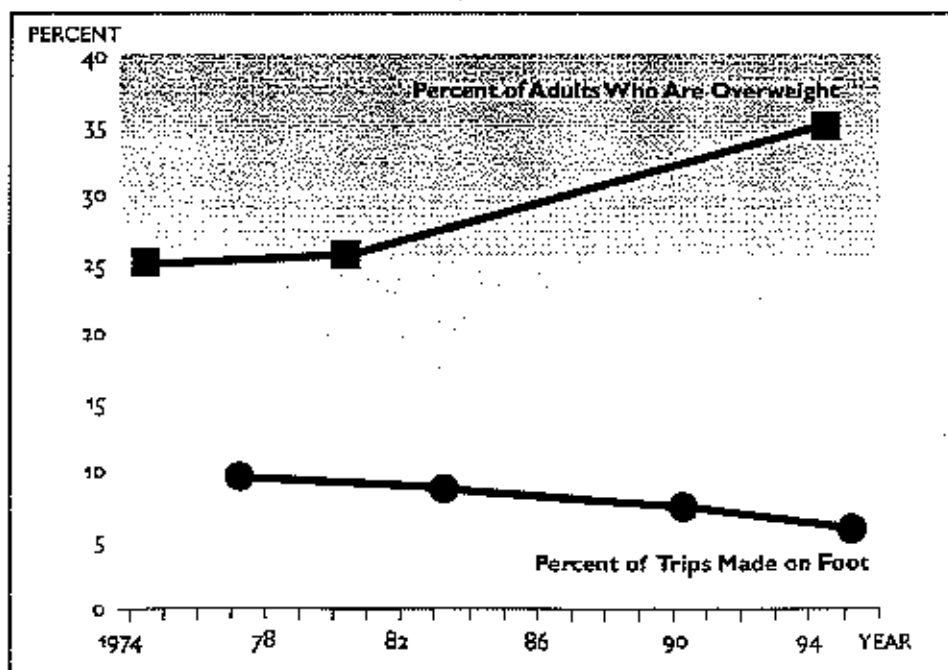
The Decline in Walking

Americans are walking much less than they used to. The number of trips people take on foot has dropped by 42 percent in the last 20 years. The Nationwide Personal Transportation Survey, conducted by the U.S. Department of Transportation, documents the decline in the amount Americans walk. Walking dropped from 9.3 percent of all trips in 1977 to just 5.4 percent in 1995. Yet more than one-quarter of all trips are still one mile or less, and by one calculation at least 123 million car trips made each day in the United States were short enough to have been made on foot.¹

Much of the decline in walking can be attributed to the increase in neighborhoods designed so that it is not safe or convenient to travel by foot. Residential areas with no sidewalks and wide streets have been built with high-speed car travel in mind. The nearest store, school, or workplace is often far beyond the quarter- to half-mile radius that is most convenient for foot travel. Workplaces are often located in office parks accessible only by car, and isolated from any other services.

The number of trips people take on foot has dropped by 42 percent in the last 20 years.

Figure 2. The Percentage of Overweight Adults has Grown as Walking has Declined



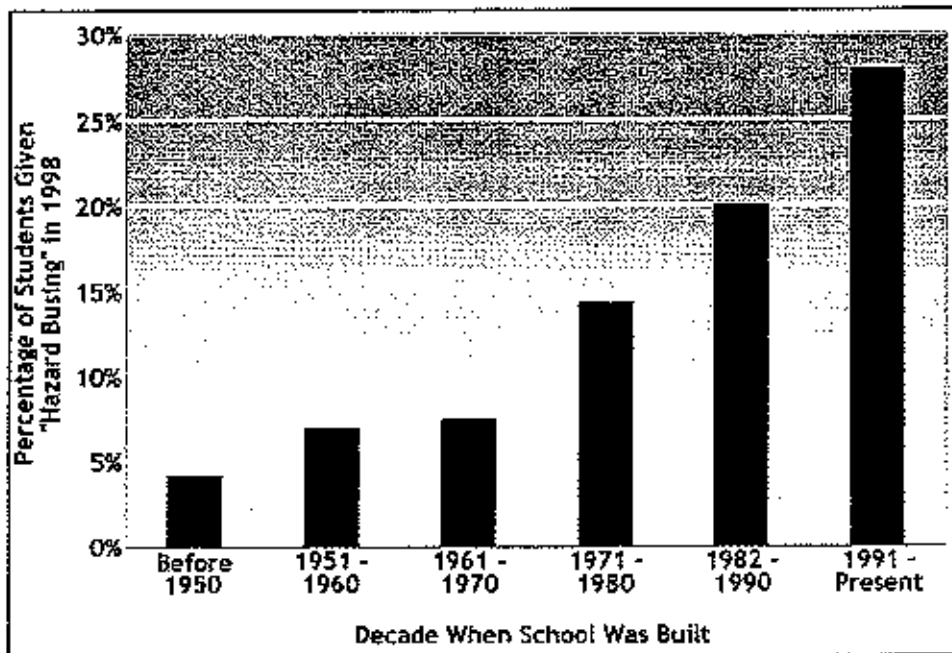
There is ample evidence from dozens of studies that compact communities that mix housing, workplaces, and shopping are places where people take more trips on foot.² But such "traditional" neighborhoods are often in the older part of town, and newer developments tend to be more automobile oriented. One recent study of Seattle neighborhoods found that the newer the development, the less likely it is that residents will walk, bicycle, or take transit.³

The decline in walking has been steep among children as well, and is also influenced by community design. In 1977, children aged five to fifteen walked or biked for 15.8 percent of all their trips. By 1995, children made only 9.9 percent of their trips by foot or bicycle, a 37 percent decline. Children now make a majority — almost 70 percent — of their trips in the back seat of a car.

The influence of community design on the decision of whether or not to walk is made clear by looking at the trend in the number of children who walk to school. Schools are increasingly isolated from the communities they serve. New schools

may be placed on the edge of communities, and wide, busy thoroughfares prevent children from biking or walking to school. Even schools that back up on subdivisions are often inaccessible by foot because there is no path to them: the only link is a circuitous street network. Many communities experience traffic jams around schools as parents deliver children to the door. Increasingly, mothers (and some fathers) are becoming the bus drivers of the new millennium. Women with school-aged children now make more car trips each day than any other population group, and on average spend more than an hour a day in the car.⁴

Figure 3. Hazard Force More Students onto Buses at Recently Built Schools



From the South Carolina Coastal Conservation League, "Wait for the Bus: How Lowcountry School Site Selection and Design Deter Walking to School," 1999.

A study in South Carolina found that students are four times more likely to walk to schools built before 1983 than to those built more recently. Hazards such as busy streets are forcing more children who live within walking distance to board a bus instead. The same study found that students are more than three times likely to get such "hazard busing" if they attend a school built after 1971.⁵

Walking Less: A Threat to Health

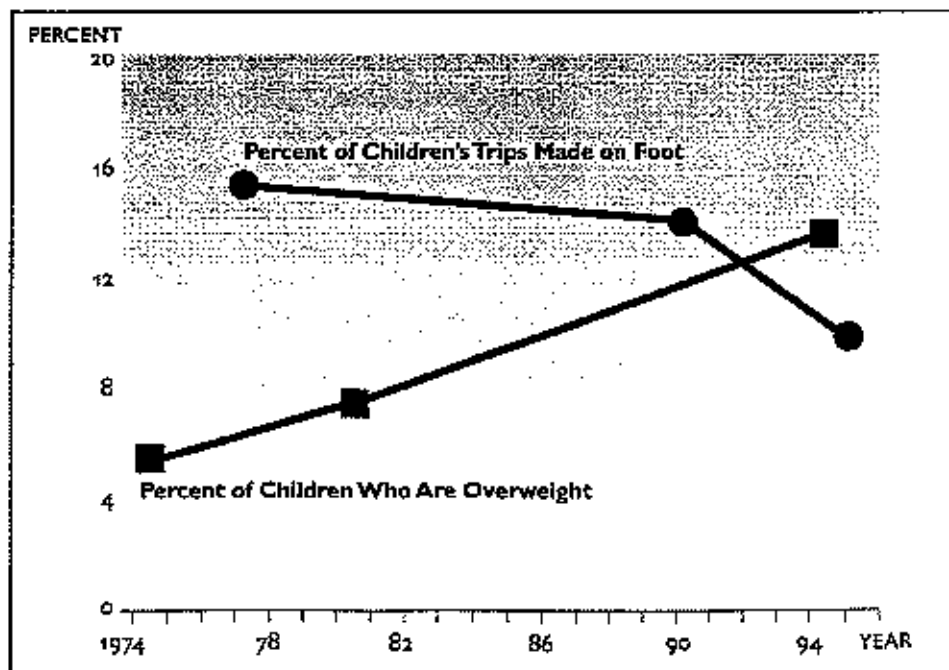
While the decline in walking has meant slightly fewer pedestrian deaths, it is contributing to a growing health threat: health problems caused by a sedentary lifestyle. The decline in walking trips has come at the same time that more Americans have become overweight (see Figure 2, pg. 15). The National Health and Nutrition Examination Surveys found that in the late 1970s (1976 to 1980) 25 percent of the population was overweight; by the early 1990s (1988 to 1994) that number had grown to almost 35 percent. Since then, the trend has apparently continued: another national health survey, the Behavioral Risk Factor Surveillance System, shows that the number of Americans defined as obese grew from twelve percent in 1991 to almost eighteen percent in 1998.⁶ Today more than half of American adults are overweight or obese.

The American Medical Association (AMA) recently declared obesity an epidemic and a major public health concern. The AMA blames the epidemic on people eating more, and on the fact that "opportunities in daily life to burn energy have diminished."⁷ In an editorial in its journal, the AMA noted that car trips have replaced trips that used to be made on foot or by bicycle, and says helping people get back to walking or bicycling should be a first target in combating the obesity epidemic. But it also noted, "Reliance on physical activity as an alternative to car use is less likely to occur in many cities and towns unless they are designed or retro-fitted to permit walking or bicycling."⁸

Obesity is just one of the health problems associated with a sedentary lifestyle. The Centers for Disease Control estimates that 300,000 Americans die each year from diseases associated with physical inactivity. Even modest physical activity, such as walking, can decrease the risk of coronary heart disease, high blood pressure, colon cancer, diabetes, and even depression.⁹

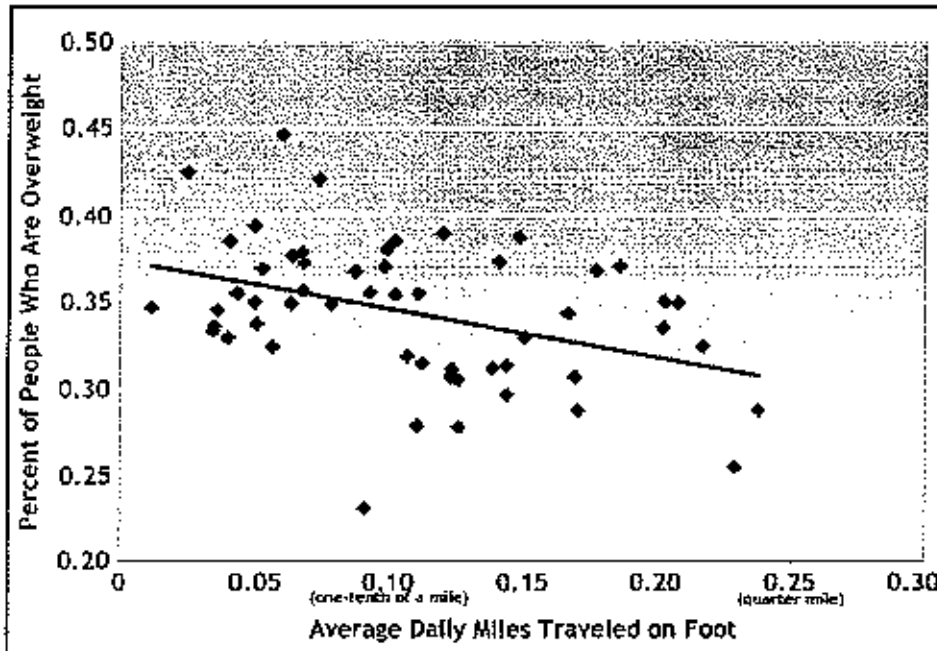
The health effects of not walking show up among children as well as adults. As children take fewer trips on foot, more of them are becoming overweight (see chart). Between the early 1970s (1971 to 1974) and the early 1990s (1988 to 1994), the portion of children who were overweight grew from 5.5 percent to 13.6 percent. Obesity among children is at an all-time high, and re-

Figure 4. Children Are Walking Less and More Are Becoming Overweight



ports bemoaning the sedentary lives of children have become commonplace. About 60 percent of obese children have risk factors that will probably translate into chronic diseases as adults.¹⁰ One study in Britain even found that children who are driven to school have an elevated risk of growing up with heart disease and brittle bones.¹¹

Figure 5. Fewer People Are Overweight in Places Where People Walk More



In comparing health research to transportation data, STPP found that metro areas where people walk less tend to be places where more people are overweight. Places where people walk further each day tend to have fewer people who are at risk of health problems due to obesity. This relationship remained when we controlled for age, race, and income. Obviously many factors contribute to this pattern, and a more detailed, controlling study of this question is needed. But our simple comparison suggests that where you live, and whether you can walk in your neigh-

borhood, may be related to your likelihood of suffering from obesity or the other dangers associated with a sedentary lifestyle.

Numerous national and local health organizations have begun promoting more walkable communities as a fundamental way to improve basic human health. The Centers for Disease Control is working to promote *Active Community Environments*; places where people can easily walk and bicycle. The California Department of Health Services has decided that better health will require a better transportation environment, stating, "Our vision is a state where doctors prescribe walking and biking to their patients, employers subsidize bike facilities and community trails, and transit services accommodate cyclists by making intermodal travel safe and seamless."

When walking to a destination is possible, a British Medical Association study shows it is well worth the extra time it may take. The study found that the extra time spent walking or cycling to a destination is more than offset by the health benefits of the cardiovascular exercise, because it extends life expectancy by more than the extra time it takes to walk or cycle.¹²

Chapter Three

THE NEGLECT OF PEDESTRIAN SAFETY

Despite the clear public health and safety problems presented by pedestrians being hit by cars, pedestrian safety is still neglected in the United States. Little federal spending goes to protect the most vulnerable road users. Most traffic safety programs are aimed at ensuring the safety of motorists, and too often pedestrians are considered at fault in accidents.

Low Spending on Pedestrian Projects

Providing basic facilities is the first step toward improved pedestrian safety. Building sidewalks, paths and other accommodations is fundamental to providing a safe walking environment. Unfortunately, the states are doing little with their federal dollars to make it safer and easier to walk. Nationwide, 5.4 percent of all trips are made on foot, and 13 percent of all traffic fatalities are pedestrians. Yet federal spending on pedestrian facilities came to less than one percent (0.6 percent) of federal transportation spending in the years studied. On average, the states spent just 55 cents per person of their federal funds on pedestrian projects, compared to 72 dollars per person on highway projects. In California, 21 percent of all traffic fatalities are pedestrians, yet the state reported spending just over four cents per person on bicycle and pedestrian facilities, far below the national average. Table 3 shows how much each state has spent on pedestrian facilities.

Some federal transportation dollars are designated for use on safety projects, but poor reporting by the states to the federal government prevents an accurate assessment of the use of these funds. New language was added to the federal transportation law TEA-21 in 1998 to specifically encourage safety spending on projects that would enhance pedestrian and bicycle safety, but few states have modified their spending criteria to use the funds in this way.

Part of the problem is that pedestrian safety has always been a secondary traffic engineering issue. The overriding goal of traffic engineering has been to improve roadway "level of service" (LOS), so that more vehicles may travel at higher speeds. That often means designing roads with wide lanes and shoulders, large turning radii at intersections, and plenty of passing and turning lanes. Few efforts have focused on ensuring that streets are safe and convenient for all road users, including pedestrians. Even the most fundamental pedestrian safety tool, the walk signal, shows this bias because in most places it allows cars to make right- and left-hand turns across the crosswalk during the walk sequence. Engineering measures to facilitate pedestrian street crossings, such as curb extensions at corners, refuge islands, and raised crosswalks have only recently been introduced in the U.S., years after they became commonplace in Europe.

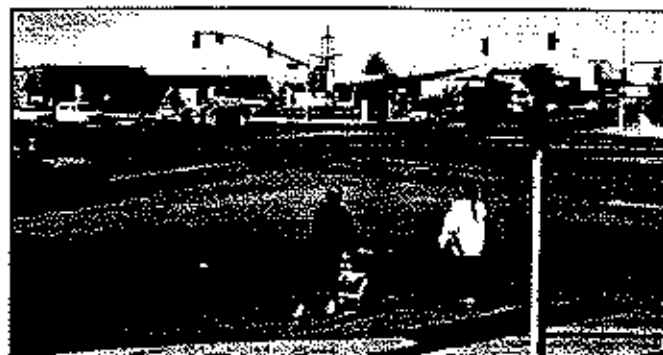


Photo by Dan Burden.

Nationwide, 5.4 percent of all trips are made on foot, and 13 percent of all traffic fatalities are pedestrians. Yet the states spent less than one percent of their federal funds on pedestrian safety.

Table 3. Federal Funding of Pedestrian Projects

State	Average Spending on Pedestrian Projects per Capita (1997-1998)	Average Spending on Highway Projects per Capita (1997-1998)	Average Percent of Spending to Peds (1997-1998)	Percent of Traffic Deaths that Were Pedestrians
California	\$0.04	\$40	0.1%	21%
Texas	\$0.07	\$57	0.1%	13%
New Jersey	\$0.08	\$52	0.2%	20%
Arkansas	\$0.12	\$91	0.1%	8%
Hawaii	\$0.14	\$85	0.3%	18%
Rhode Island	\$0.15	\$88	0.1%	12%
Indiana	\$0.15	\$75	0.3%	8%
Michigan	\$0.18	\$58	0.2%	12%
Kentucky	\$0.18	\$97	0.1%	8%
Minnesota	\$0.18	\$48	0.3%	9%
West Virginia	\$0.19	\$181	0.1%	8%
Iowa	\$0.21	\$83	0.2%	6%
Louisiana	\$0.21	\$66	0.3%	14%
District of Columbia	\$0.21	\$184	0.1%	35%
Pennsylvania	\$0.22	\$58	0.3%	11%
Wisconsin	\$0.23	\$60	0.3%	8%
South Carolina	\$0.27	\$87	0.3%	12%
North Carolina	\$0.28	\$74	0.3%	12%
Maryland	\$0.29	\$57	0.3%	18%
Utah	\$0.30	\$34	0.4%	12%
Arizona	\$0.34	\$52	0.5%	16%
Missouri	\$0.42	\$82	0.4%	9%
Virginia	\$0.43	\$54	0.8%	10%
Ohio	\$0.49	\$52	0.7%	9%
Alabama	\$0.52	\$65	0.7%	8%
Mississippi	\$0.53	\$83	0.6%	6%
Illinois	\$0.58	\$46	0.8%	14%
Tennessee	\$0.67	\$75	0.8%	8%
Florida	\$0.71	\$52	1.0%	19%
Nevada	\$0.75	\$70	0.9%	15%
New Mexico	\$0.78	\$88	0.7%	14%
Georgia	\$0.79	\$87	0.9%	11%
Wyoming	\$0.79	\$214	0.6%	5%
Maine	\$0.88	\$71	0.8%	9%
Colorado	\$0.90	\$45	1.4%	11%
Oklahoma	\$0.95	\$91	0.8%	7%
Kansas	\$0.98	\$73	1.2%	7%
Washington	\$1.05	\$52	1.2%	11%
New York	\$1.22	\$47	1.2%	24%
South Dakota	\$1.23	\$189	0.8%	4%
Nebraska	\$1.43	\$108	1.2%	6%
Oregon	\$1.63	\$88	1.3%	12%
Idaho	\$1.74	\$90	1.6%	5%
North Dakota	\$1.88	\$228	0.8%	5%
Connecticut	\$1.91	\$66	1.8%	15%
Massachusetts	\$2.05	\$61	2.1%	20%
New Hampshire	\$2.09	\$72	2.8%	9%
Montana	\$2.14	\$177	1.0%	4%
Vermont	\$2.61	\$122	1.4%	12%
Delaware	\$2.86	\$142	1.8%	11%
Alaska	\$10.73	\$242	3.6%	12%
Nationwide	\$0.65	\$72	0.6%	13%

Blaming the Victim

Pedestrians are often considered at fault in crashes, obscuring the real issue of safe pedestrian facilities. Police reports are often designed to describe vehicle-pedestrian collisions in terms of what the pedestrian did wrong.¹ Seldom do reports of pedestrian fatalities, particularly in the media, record the actions of the driver, describe how fast the car was traveling, or note whether the motorist was paying attention. Yet research has concluded that the fault of pedestrian-vehicle collisions frequently rests with drivers. When investigating child pedestrian injury cases, a recent study found that "drivers leave most of the responsibility for avoiding collisions to the [child] pedestrian."²

The police also may be ignoring illegal driver behavior. A study of police reports from deadly pedestrian crashes in New York City found that in 74 percent of the cases, drivers were speeding, had illegally turned into a crosswalk, had run a stop light, or were otherwise culpable in the death. Yet only sixteen percent of drivers were cited, and less than one percent were cited for violating laws specific to pedestrian safety.³

Many pedestrian safety projects are aimed at pedestrians rather than at drivers. Many cities have responded to pedestrian deaths with crackdowns on jaywalking. In some areas, the response to high pedestrian accidents has been to actively discourage walking. In Santa Ana, California, the solution to high death rates was to prohibit pedestrians from using medians as refuges from speeding traffic.⁴ Other communities have removed crosswalks or put up signs prohibiting pedestrian crossing. These actions will do little to discourage people who must walk to get where they are going, and may result in more pedestrian deaths and injuries, not less.

Many safety programs for children focus on training them to be extremely cautious in crossing the street. But evaluations of these programs show their effectiveness to be mixed at best, and some studies show children under seven simply do not have the necessary developmental skills to determine when cars are a danger.⁵ More and more health and safety researchers are recognizing that making the environment safer is of crucial importance, especially for children.

A study of New York City police reports found that in 74 percent of the deadly pedestrian crashes drivers were culpable in the death.

Chapter Four

SOLUTIONS FOR SAFER STREETS

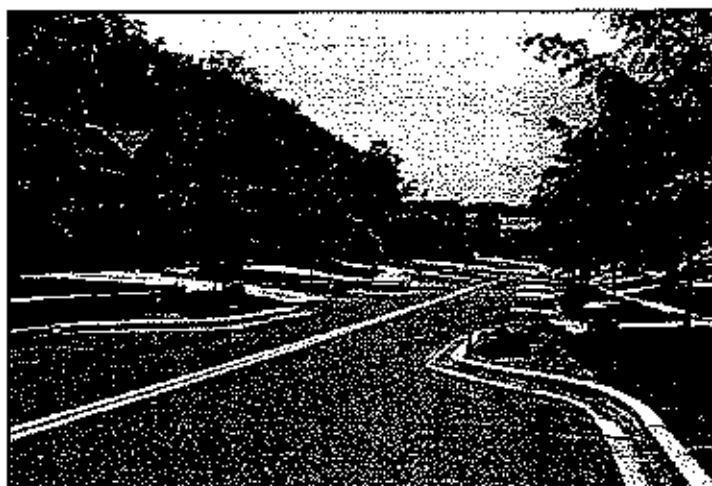
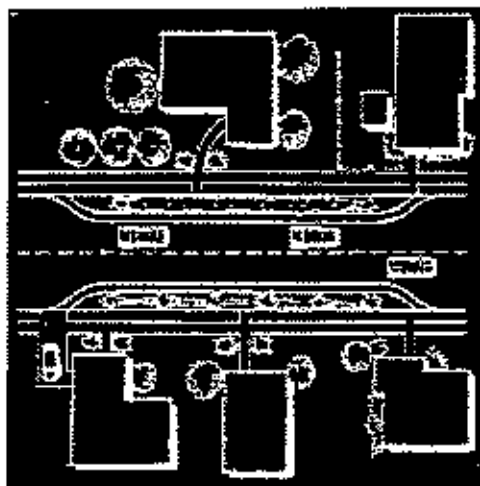
Improving pedestrian safety while simultaneously increasing the opportunity to walk presents a challenge for many communities used to designing roadways only for the automobile. But the need is clear, as stated by a recent Federal Highway Administration policy paper on designing for pedestrians and cyclists:

“There is no question that conditions for bicycling and walking need to be improved in every community in the United States; it is no longer acceptable that 6,000 bicyclists and pedestrians are killed in traffic every year, that people with disabilities cannot travel without encountering barriers, and that two desirable and efficient modes of travel have been made difficult and uncomfortable.”¹

While we’ve outlined the many barriers to pedestrian safety, there is a clear path to safer streets. It includes retrofitting streets to make walking safer, designing communities to encourage walking, investing in pedestrian safety, and studying the pedestrian safety problem.

Retrofitting Streets: More than Crosswalks

Since so many of our streets have been designed exclusively with automobiles in mind, it takes more than a crosswalk and a walk signal to make them safe and inviting for pedestrians. Many communities across the country are making streets safer with traffic calming techniques.² Traffic calming redesigns streets to reduce vehicle speeds and give more space and priority to cyclists and pedestrians. Traffic calming includes a variety of changes that slow or divert vehicle traffic, separate pedestrian pathways from vehicle traffic, and make the road corridor more pleasant. Common traffic calming measures include landscaped



The “choker” as depicted above slows down traffic by decreasing street widths. The image on the right shows this type of traffic calming device in practice in Montgomery County, Maryland. Photos from Fehr and Peers Associates.

traffic circles, medians or extended sidewalks that narrow the roadway, and partial closures to divert through traffic. Many communities are slowing traffic with speed humps, but the most successful projects integrate a variety of techniques that make the street more attractive and inviting for people on foot and bicycle. The Institute of Traffic Engineers has published a manual on traffic calming; to see it visit <http://www.ite.org/traffic/index.htm>.

Studies have shown that traffic calming is very effective in reducing vehicle speeds and reducing collisions. One study found that traffic calming reduced speeds by four to twelve miles per hour. Officials in Seattle, Washington, estimate that their traffic circle program prevented 273 accidents over four years, saving \$1.7 billion in property and casualty losses. An international study of traffic circles found they reduced collisions by an average of 82 percent.³

Designing for Pedestrians

Traffic calming is but one part of a broader attempt to fundamentally refocus the design of both streets and communities so that walking is safe and convenient.

Encouraging pedestrian travel means designing communities so that people have somewhere to walk to. That means developing neighborhoods where residents are within a reasonable walking distance of shops, offices, schools, libraries, and transit stops. According to the American Planning Association's *Best Development Practices*, the best neighborhoods for walking are developed in small clusters, with well-defined centers and edges, and compact commercial centers.⁴ The street network in these neighborhoods should include multiple connections and direct routes that allow pedestrians to choose the shortest distance to a destination. Schools should also be placed so children can walk and bicycle without having to cross high-speed streets.

An international study of traffic circles found they reduced collisions by an average of 82 percent.



In a typical suburban strip mall, the streets are wide, encouraging cars to travel at high speeds. Sidewalks end abruptly or lack pedestrian amenities such as trees. Pedestrians have no safe place to cross the street, and few close destinations. Provided by Calthorpe Associates and Urban Advantage.



A computer-enhanced image shows how curb bulbouts, crosswalks, trees and more compact development can make this area more pleasant and walkable. Calthorpe and Associates and Urban Advantage.

When it comes to designing roads, engineers traditionally begin at the centerline and by the time they reach the road edge, they have often “run out” of room for pedestrian “amenities.” New design policy guidelines issued by the Federal Highway Administration (FHWA) recommend that state and local planners and road builders drop that approach, and design all facilities from the start with pedestrians and cyclists in mind. The new guidance calls for re-writing highway design manuals so they reflect this new, more balanced approach. One effort is underway in Delaware, where the state Department of Transportation, with STPP’s help, is writing a traffic calming design manual, the first of its kind in the U.S. The manual covers street design, signing and marking, and other planning and engineering issues.

This is part of a wider movement toward designing highways in context, to make sure they respect the cultural, environmental, and scenic assets in a community. A number of states are revamping the process they use for designing roads, but only one state has completely rewritten its standards. Vermont re-wrote its standards in the mid-1990s to allow lower design speeds, and narrower roadways. The standards have also been codified under state law, essentially removing the fear of lawsuits.

Investing In Pedestrian Safety

Making pedestrian safety a priority means investing transportation funds in pedestrian facilities and safer streets. Each state should attempt to align pedestrian safety funding to pedestrian safety needs, as indicated by rates of fatalities and injuries: if 25 percent of a state’s traffic deaths are pedestrians, it should con-

sider allocating a similar share of safety funding to making walking safer. State Departments of Transportation should target such funding by using a systematic approach for identifying problem areas for pedestrians, similar to the systems now used to identify high accident areas for vehicles. When it comes to funding, dangerous pedestrian areas should be considered on an equal footing with dangerous locations for motor vehicles.

One way to begin to direct money into pedestrian safety is to focus on one of the most critical needs, creating safe routes to school. The state of California recently passed a law that reserves one-third of the state's TEA-21 federal safety set-aside for a program that will fund traffic calming, crosswalks, sidewalks, bike lanes and paths in and around California schools. The law was deemed necessary because the California Department of Transportation (Caltrans) hadn't taken any action to update its safety set-aside program to reflect the changes TEA-21 made with regard to bicyclists and pedestrians. School districts will assess the need for improvements around their schools, and apply for grants from the state. For a copy of this model legislation, visit <http://www.bayped.org/saferoutes.html>.

Promoting Walking: Walk A Child to School Day

A "Safe Routes to School" movement is spreading across the United States as parents and school and health officials see a need to help give children a more independent and healthier way to get around. "Walk to School Day" is an event held each fall to call attention for the need for a safe walking environment. (In 2000, the "International Walk to School Day" is being held on October 4th.) Thousands of schools organize groups of parents, teachers, and students to walk school, often inviting local officials to highlight the need for safe routes to schools. For more information, visit <http://www.iwalktoschool.org>.

Studying Pedestrian Safety

Another fundamental step in improving pedestrian safety is to collect more information about pedestrian fatalities and injuries, the amount of walking and the risks associated with walking, the effectiveness of pedestrian safety measures, and even how much is spent on pedestrian facilities. Federal databases concentrate on collecting information about motor vehicles and the data collected about pedestrians are incomplete and often inaccurate, crippling attempts to improve pedestrian safety.

While the Federal Highway Administration is able to forecast the amount of driving annually, no attempt is made to determine the amount of walking each year. The FHWA database that records all federal transportation spending, the Fiscal Management Information System (FMIS), includes hundreds of categories aimed at collecting many details on highway construction, but only allows the most rudimentary assessment of how much is being spent to make walking safe and convenient. The Fatality Analysis Reporting System (FARS) records the entire 17 digit vehicle identification number for every vehicle involved in a fatal accident, but it often doesn't record where a pedestrian was when they were hit (for 22 percent of pedestrian deaths, FARS could not identify whether

FARS records the entire 17-digit vehicle identification number for every vehicle involved in a crash, but often fails to note a pedestrian's location when they were hit.

the pedestrian was inside or outside of a crosswalk, or even whether there was a crosswalk in the vicinity of the accident). The US Bureau of Transportation Statistics and the National Transportation Safety Board should design research programs specifically aimed at capturing new information about this important travel mode and the risks associated with it.

Local officials and citizens also have a role to play, by identifying unsafe walking environments. The Partnership For A Walkable America and other groups offer “walkability audits” that individuals and community groups can use to assess problems in their neighborhood. In many places, citizens have invited local officials on such walks to show them the dangers pedestrians face. For more information, visit <http://www.nsc.org/walk/wkcheck.htm>.

Recommendations:

Spend on pedestrian safety in proportion to pedestrian deaths.

If thirteen percent of all traffic fatalities are pedestrians, it stands to reason that a similar amount of safety funds should be devoted to pedestrian safety. In addition, federal transportation dollars no longer restricted to highway use should be directed toward providing a variety of safe and convenient pedestrian facilities.

Retrofit streets with traffic calming.

With so many streets designed only for automobiles, it will take more than a few sidewalks and crosswalks to make them safe and inviting for pedestrians. Traffic calming techniques, such as curb bulb-outs and traffic circles, slow down automobiles in key places and reclaim streets for children, residents, and others on foot or bicycle.

Design new streets and neighborhoods for walking.

More people will walk in neighborhoods where there is somewhere to walk to. The best neighborhoods for walking put residents within a reasonable distance of shops, offices, schools, and transit stops, and provide a street and path network that allows direct routes between them.

Collect more information on pedestrian safety.

Federal databases provide little information about the risks associated with walking, the effectiveness of pedestrian safety measures, or even how much is spent on pedestrian safety. The National Transportation Safety Board (NTSB) and the US Bureau of Transportation Statistics should design research programs to learn more about how to improve pedestrian safety. On the local level, citizens are already performing “walkability audits” that assess the dangers to pedestrians, block by block.

Methodology

Pedestrian Fatalities

The National Highway Traffic Safety Administration collects data on every traffic fatality (pedestrian or otherwise) occurring on U.S. roadways. To determine how many pedestrians were killed in a given year and county, STPP queried the Fatality Analysis Reporting System (FARS) for pedestrians who suffered fatal injuries. We then aggregated the county-level data to the state, Metropolitan Statistical Area (MSA) or New England County Metropolitan Area (NECMA) for some 330 metro areas across the U.S. Dividing this figure by the appropriate population estimate from the U.S. Census Bureau, and multiplying by 100,000 gave us a yearly fatality rate per 100,000 persons. (See the U.S. Census Bureau for definitions of MSA and NECMA, <http://www.census.gov/population/www/estimates/aboutmetro.html>.)

FARS also collects data on the age of the pedestrian killed, allowing STPP to calculate the number of children or elderly pedestrians killed by automobiles. Dividing this number by the total number of pedestrian fatalities gives the proportion of pedestrians killed in a given age group. At the state level, STPP divided the number of child pedestrian fatalities by the population under age 18 to arrive at a state-by-state fatality rate for children.

STPP created the "Pedestrian Danger Index" to allow for a truer comparison of metro areas that takes into account the exposure that pedestrians face in a given metro area. For example, while slightly more pedestrians are killed per capita in the New York metropolitan area than are killed in the Dallas-Fort Worth metro area, more than three times as many people walk in New York than in Dallas. So, the portion of New York residents exposed to the risk of being killed as a pedestrian is three times higher than in Dallas. We calculated the Pedestrian Danger Index by dividing the average yearly fatality rate for a metro area by the percentage of commuters walking to work in that metro area, and then normalizing that figure to 100. Our exposure measure, the percentage of commuters walking to work is provided by the U.S. Census Bureau's 1990 Decennial Census.

Health

STPP performed a simple analysis of health and transportation data at the metro level to determine if there was a relationship between walking and health. While there is an large body of literature supporting the theory that daily exercise helps maintain health, little research has been done on the benefits of walking to work or to run daily errands.

Using data from the Centers for Disease Control's 1998 Behavioral Risk Factor Surveillance System (BRFSS), we determined the percentage of residents in metro areas who are at risk for health problems because of being overweight. We compared this to the number of miles walked daily for residents in forty

large metro areas across the U.S. This was derived using the 1995 Nationwide Personal Transportation Survey (the most recent available) and multiplying the average walk trip length by the average number of daily trips per person. Running a bivariate correlation of the two variables shows a relationship significant at the 0.001 level. The relationship between walking and weight proved enduring, even when other possible influences on obesity were considered. The percent of the population who were overweight continued to decline significantly as daily miles walked per capita increased, controlling for differences in age (percent of population over 45 years), race (percent of population who were minorities), and income (percent of population under the poverty level). Plotting the two variables on a scatter plot also shows evidence of a relationship – there is a slight, but noticeable downward trend in the metro areas, indicating that as the distance walked increases, the percentage of overweight residents in a metro area decreases. Our comparison, while certainly not a rigorous analysis, shows that there may indeed be a relationship, and that this merits further study by professionals in the health field.

Safety Spending

STPP calculated spending figures from the Federal Highway Administration's Fiscal Management Information System – a huge database containing details on every surface (and some waterborne) transportation project receiving federal funds. For the purposes of this report, we queried the database for projects with a work type related to specifically pedestrian programs and facilities, or bicycle and pedestrian programs and facilities. Projects that were specific to bicycles were omitted. Dividing this figure by the appropriate population estimate from the U.S. Census Bureau gives us the amount spent on pedestrian projects per capita. For a point of reference, we also performed this analysis for highway projects. See STPP's "Changing Direction: Federal Transportation Spending in the 1990s" (<http://www.transact.org>) for a more comprehensive analysis as well as more information about this data source.

The percentage of federal funds spent on pedestrian projects was determined by dividing the amount derived above by the total federal funds spent (including funds devoted to transit). At the national level, STPP compared this number to the percent of trips taken by foot, from the 1995 Nationwide Personal Transportation Survey.

Endnotes

Chapter One

1. Values given are for million vehicle miles traveled.
2. Unfortunately, comprehensive injury data is not available by state or metropolitan area and so is not included as a part of the Pedestrian Danger Index.
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4. Charles Zeeger, Patrik McMahon, and Dan Burden, "Key Engineering Barriers to Reducing Child Pedestrian Injuries and Deaths." Paper Presented to the Centers for Disease Control, Atlanta, Georgia, September 1998.
5. Lack of data prevented calculation of an accurate pedestrian danger index for children; state level deaths per 100,000 are the best measure of child pedestrian death risk.
6. Surface Transportation Policy Project, "Caught in the Crosswalk." San Francisco, Calif., September 1999.
7. Ibid.
8. Centers for Disease Control, "Morbidity and Mortality Report." Atlanta, Georgia, July 23, 1999.
9. Joey Ledford, "Buford Highway Fixes Sought," *The Atlanta Journal Constitution*, 17 May 2000.
10. Sylvia Moreno, "Fatalities Higher for Latino Pedestrians," *The Washington Post*, 27 August 1999.
11. John Pucher, "Making Walking and Cycling Safer: Lessons from Europe," *Transportation Quarterly*, Summer 2000 (forthcoming).

Chapter Two

1. Katie Alvord, *Divorce Your Car!* Gabriola Island, British Columbia: New Society Publishers, 2000.
2. For a summary of 42 such studies, see Reid Ewing and Robert Cervero, "Travel and the Built Environment," (forthcoming).
3. Larry Frank, "Land Use and Transportation Interaction: Implications on Public Health and Quality of Life," *Journal of Planning, Education, and Research*, October 2000.
4. Surface Transportation Policy Project, "High Mileage Moms," Washington, D.C., May 1999. Full text available at <http://www.transact.org>.
5. South Carolina Coastal Conservation League, "Wait for the Bus: How Lowcountry School Site Selection and Design Deter Walking to School," Charleston, S.C., 1999. See <http://www.scccl.org>.
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10. Ali Mokdad, et al, "The Spread of the Obesity Epidemic in the United States, 1991-1998," 1519.
11. Institute of Child Health, "The School Run: Blessing or Blight?" London, England, 1999. This report is available from the Pedestrian's Association, 126 Aldersgate Street, London, England EC1A 4JQ.
12. John Pucher, "Transportation Paradise: Realm of the Nearly Perfect Automobile?" *Transportation Quarterly*, Summer 1999. British Medical Association, *Cycling Toward Health and Safety*. Oxford, England: Oxford University Press, 1992.

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1. Roberts and Coggan, "Blaming Children for Child Pedestrian Injuries," *Social Science Medicine* 38, no. 5 (1994): 749-753.
2. Lightstone, Peek-Asa and Kraus, "Relationship between driver's record and automobile versus child pedestrian collisions," *Injury Prevention* 3, no. 4 (Dec. 1997): 262-266.

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3. Right of Way, "Killed by Automobile," New York, N.Y., March 1999. See <http://www.rightofway.org> or contact (212) 260-5237.
4. Richard Marosi, "Where Pedestrians See Refuge in Medians, Officials See Danger," *The Los Angeles Times*, 7 September 1999: B1.
5. James Thomson & Andrea Giclen, "The Role of Elementary and Adult Education in Childhood Pedestrian Injuries." Paper Presented to the Centers for Disease Control, Proceedings to Prevent Pedestrian Injuries, Atlanta, Georgia, September 1998.

Chapter Four

1. Federal Highway Administration (1999). Accommodating Bicycle and Pedestrian Travel, A Recommended Approach. <<http://www.fhwa.dot.gov/environment/bikeped/Design.htm>>
2. To learn more about traffic calming techniques, visit the Institute of Traffic Engineer's Traffic Calming website, at <http://www.ite.org/traffic/index.htm>
3. Reid Ewing, *Traffic Calming: State of the Practice*. Washington, D.C.: American Planning Association, 1999.
4. Reid Ewing, *Best Development Practices*. Washington, D.C.: American Planning Association, 1996

Resources

General Information

Pedestrian and Bicycle Information Center

<http://www.walkinginfo.org>

National Safety Council Partnership for a Walkable America

<http://nsc.org/walkable.htm>

Walkable America Checklist

<http://nsc.org/walk/wkcheck.htm>

The Federal Highway Administration Bicycle and Pedestrian Program

<http://www.fhwa.dot.gov/environment/bikeped/index.htm>

The Federal Highway Administration's Pedestrian Safety Roadshow

<http://www.ota.fhwa.dot.gov/walk/>

The Federal Highway Administration Pedestrian and Bicycle Safety Research Page

<http://www.tfhrc.gov/safety/pedbike/pedbike.htm>

The Federal Highway Administration's Design Guidance for Accommodating Bicycle and Pedestrian Travel

<http://www.fhwa.dot.gov/environment/bikeped/Design.htm>

The National Highway Traffic Safety Administration (NHTSA)

<http://www.nhtsa.dot.gov>

The National Highway Traffic Safety Administration's Pedestrians, Bicycles and Motorcycles Page

<http://www.nhtsa.dot.gov/people/injury/pedbimot/>

Fehr and Peers Associates, Inc. Traffic Calming website

<http://www.trafficcalming.org>

Institute of Transportation Engineers' Traffic Calming for Communities

<http://www.ite.org/traffic/index.htm>

Advocacy Groups

America WALKs

<http://americawalks.org/>

The National Center for Bicycling and Walking

<http://www.bikefed.org>

Walkable Communities, Inc.

<http://www.walkable.org>

Congress for the New Urbanism

<http://www.cnu.org>



Photo by Dan Burden.

Right of Way
<http://www.rightofway.org>

Urban Ecology
<http://www.urbanecology.org>

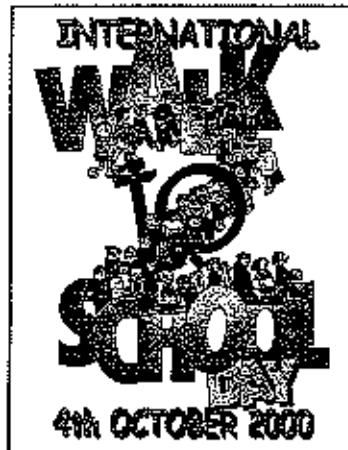
Transportation Alternatives
<http://www.transalt.org/>

Professional Organizations

Association of Bicycle and Pedestrian Professionals
<http://www.apbp.org>

The Human Powered Transportation Committee of the Society for Civil Engineers
<http://ourworld.compuserve.com/homepages/kbarrett/asce-hpt.htm>

The Institute for Transportation Engineers
<http://www.ite.org>



Other

International Walk to School Day
<http://www.iwalktoschool.org>

California's Safe Routes to School Bill
<http://www.bayped.org/saferoutes.html>

Transportation Alternatives in New York City, Safe Routes to School Program
<http://www.transalt.org/campaigns/school/index.html>

See Also

Scenic America, *Getting It Right In the Right of Way: Citizen Participation in Context-Sensitive Highway Design*, 2000. <<http://www.scenic.org>>

Todd Litman, Robin Blair, Bill Demopoulos, Nils Eddy, Anne Fritzel, Danelle Laidlaw, Heath Maddox and Katherine Forster. *Pedestrian and Bicycle Planning: A Guide to Best Practices*. This report is available from the Victoria Transport Policy Institute at <http://www.vtpi.org>.

John Pucher and Lewis Dijkstra, "Making Walking and Cycling Safer: Lessons from Europe." This forthcoming report will be published in *Transportation Quarterly*, vol. 54, no. 3, Summer 2000.

Appendix

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